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Vaccine-Preventable Disease 1996 Annual Report

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Bureau of Immunization

State health officials in Missouri have been documenting cases of various communicable diseases for more than a century. The State Board of Health reported cases of diphtheria, scarlet fever and typhoid in its annual report as early as 1888. By 1921, the Board systematically kept records for 27 diseases. In 1939, the Missouri Legislature enacted a law giving the Board statutory authority to collect information on diseases that are a threat to public health. In 1948, that law was further defined by a rule that listed the diseases that would be monitored and the precautions for each. Since that time, the Department of Health has periodically amended the list of reportable diseases to reflect concerns about emerging pathogens.

Over the past several decades, effective vaccines have been developed for many diseases that are life threatening or can result in serious long-term complications. The mission of the Bureau of Immunization is to ensure that these vaccines are widely distributed in order to prevent, control and eliminate vaccine-preventable diseases in Missouri. As vaccines become available and accessible to the general public, it is essential to develop and maintain a surveillance system that continues to track the incidence of these diseases.

"Surveillance of disease is the continuing scrutiny of all aspects of occurrence and spread of a disease that are pertinent to effective control," according to *Control of Communicable Diseases in Man*, 16th Edition, published by the American Public Health Association in 1995. A good surveillance system provides complete and accurate reporting that can identify individuals and communities that have not been immunized adequately. The data can also lead to better information about the efficacy of specific immunizations and, ultimately, to better control and even elimination of vaccine-preventable diseases.

The Bureau of Immunization manages the surveillance system that reports vaccine-preventable diseases in Missouri. It collaborates with the Missouri State Public Health Laboratory, local health departments and private providers to collect information on suspected cases of vaccine-preventable diseases. If the State Public Health Laboratory confirms a report of such a disease, the bureau determines a zone of risk. Active surveillance is maintained for everyone in this zone of risk—family and neighborhood contacts and, for cases among school children, exposure through contacts such as in the classroom, at sporting events and on buses. Immunization histories are obtained and susceptible persons are immunized. Any cases of disease that are discovered are transmitted weekly to the Centers for Disease Control and Prevention (CDC) through the National Electronic Telecommunications Surveillance System (NETSS). In addition, the bureau annually reviews death certificates to determine mortality due to vaccine-preventable diseases.

The surveillance system is entirely dependent upon the cooperation of private providers and local public health agencies who report to the Department of Health. The department relies upon the expertise of clinicians to identify probable cases and submit specimens to

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the State Public Health Laboratory for appropriate testing. We thank those reporters who are cognizant of the significance of this system for their efforts in providing complete and accurate information on all suspected cases of vaccine-preventable diseases.

During 1996, 74 cases of pertussis (whooping cough) were reported, an increase from 63 cases in 1995. There were no deaths from pertussis. Cases occurred in all health districts of the state and did not appear to be epidemiologically linked. Fifty-one (38) percent of the cases occurred in infants 6 months of age and under. Twenty-eight (21) percent of the cases occurred in children aged 1 to 18 years and 20 (15) percent occurred in children aged 6 months to a year. Table 1 describes the results of the testing of pertussis specimens submitted to the State Public Health Laboratory during 1996.

Cases of pertussis continue to occur, though only in part because of incomplete immunization coverage. Multiple doses of vaccine and regular boosters are required for children under 7 years of age in order to produce and retain immunity. Immunity wanes over time, so infants who are not fully immunized may be infected by older children and adults. It is not recommended that persons over age 7 receive routine vaccination because vaccine reactions are thought to be more frequent and because pertussis-associated morbidity and mortality decrease with age. When outbreaks occur, antibiotics are used to control the disease among older children and adults; vaccine has limited usefulness in these situations.Continued research must be done to develop a pertussis vaccine that is safe and effective for those over 7 years of age. DTaP, which contains the acellular pertussis vaccine, is being investigated for this purpose.

In 1996, there were three reported cases of measles (rubeola), compared with two cases in 1995. Two of the three positive cases in 1996 were 25-year-old males who had traveled to Las Vegas and were epidemiologically linked to an outbreak there. The other case was isolated, and involved a 29-year-old male. No source of infection was identified. There were no reported cases of rubella in Missouri in 1996.

One nonfatal case of tetanus was reported during 1996 in a 75-year-old retired farmer who had no prior history of receiving the tetanus toxoid.

Surveillance of preventable diseases is essential to the initiation of interventions that stop the spread of disease. It is important that immunization rates in Missouri continue to rise to, and then be maintained at, a level higher than the 76 percent that we have currently achieved.

The Department of Health is working with both public and private providers to reach the goal of completely immunizing 90 percent of Missouri's 2-year-olds by September 1997. Identifying all cases of vaccine-preventable disease, together with accompanying demographic information, will greatly assist the department as it seeks to better target its immunization efforts in the future.

Table 1. Missouri Pertussis Specimens Submitted to the Missouri State Public Health Laboratory, 1996

Month	Total Specimens Received	Total Positive Cases	Percent Positive
January	105	1	1.0
February	58	1	1.7
March	71	2	2.8
April	40	4	10.0
May	75	6	8.0
June	44	5	11.4
July	53	6	11.3
August	64	15	23.4
September	48	4	8.3
October	66	5	7.6
November	86	16	18.6
December	144	9	6.3
Total	**854**	**74**	**8.7**

TELECONFERENCE

Immunization Update 1997

The Centers for Disease Control and Prevention will present the satellite broadcast, "Immunization Update 1997," on September 11, 1997. The time for the conference has not yet been determined.

This 2.5 hour live interactive program will provide updates on: new vaccines and vaccine combinations; polio vaccine and global polio eradication; rotavirus vaccine; new recommendations from the Advisory Committee on Immunization Practices (ACIP) for measles, hepatitis B, pneumococcal and influenza vaccines; and why and how to assess the immunization rates in your practice. The broadcast will feature a question and answer session in which participants nationwide can interact with the course instructor via toll-free telephone lines.

This session is designed for physicians, nurses, physician assistants, pharmacists, medical students, nurse practitioners and their colleagues in both the public and private sectors who give immunizations or set policy for their offices or clinics.

Continuing education credit will be offered for a variety of professions, based on 2.5 hours of instruction. ACPE pharmacy continuing education accreditation (0.25 contact hours) is pending approval.

For more information about the course or for site locations, contact the immunization representative in your district health office or the Bureau of Immunization at (573) 751-6133.

Animal Rabies Surveillance - 1996

F. T. Satalowich, D.V.M., M.S.P.H.
Bureau of Veterinary Public Health

Missouri continues to experience a low incidence of rabies activity, with only 26 cases of animal rabies in 1996. The 26 cases of rabies were derived from examining 1,915 satisfactory specimens. The 26 cases occurred in 12 counties, with Howell county accounting for 11 of the cases.

Missouri has two reservoirs for rabies: the skunk, which is affected with two different strains, and the bat. Twelve of the 26 cases were in skunks; 11 of them from Howell County. It is of interest that the counties surrounding Howell County did not detect any wildlife rabies. Douglas and Howell counties each had a case of bovine rabies. Two other counties had rabies cases in cats (McDonald and Greene) and a dog (Greene), yet did not detect rabies in the wildlife animal reservoir. The nine other cases of rabies were in the bat species and originated from Benton, Buchanan, Jefferson, St. Charles and St. Louis counties.

For the past seven years Missouri has averaged only 31 rabies cases per year. This low prevalence of rabies in Missouri is generally attributed to the low skunk population in the state. Since skunks are the main reservoir for rabies in Missouri, any fluctuation of population or disease in these animals affects the overall rabies picture in the state.

While the number of animal rabies cases has remained low for several years, Missouri continues to be endemic for rabies. The low number of rabies cases can, in part, be attributed to the passive surveillance system, particularly of the wildlife species. Many counties continue to experience difficulty in transporting rabies specimens to the three state laboratories. Credit, however, must be given to Missouri communities for practicing the Cardinal Rules of Rabies Control (see sidebar on this page). Following these rules has proven successful in controlling rabies.

Cardinal Rules of Rabies Control

- All dogs, cats and ferrets should be professionally vaccinated.
- A program of stray animal control should be instituted.
- Individuals should be instructed to stay away from wild and stray animals.
- **All** animal bites should be medically evaluated.

In a rabies endemic area, animal bites or scratches should be reported to either public health or private medical authorities for evaluation and possible post-exposure rabies treatment. This treatment consists of rabies immune globulin and five doses of rabies vaccine. The treatment is considered most efficacious and relatively painless. It is, however, an expensive procedure. The cost of professional vaccination of a dog, cat or ferret and the application of observation periods for these animals is minimal in comparison to the $1,200 to $1,500 cost of human post-exposure treatment.

It is essential that the need for rabies post-exposure treatment of individuals exposed to bats be evaluated very carefully. When asked whether they have been bitten by an animal, most people visualize an open bleeding wound. Because of the miniature nature of bats' teeth, this is not the picture presented after a bat bite. This is especially true in a child's recollection of a bite. Special precautions should be exercised by medical personnel in evaluating bat exposures. When a bat is present and the reasonable possibility of a bite or scratch cannot be excluded, post-exposure treatment should be considered unless diagnostic tests are negative.

Based on the latest evidence of the danger of bat rabies to humans, a reeducation of the public is necessary. The general prevention rule is, **stay away from bats**. Do not invite them into your house nor your back yard.

In 1996, all 96 bats submitted to the State Public Health Laboratory in Jefferson City for rabies testing were speciated to learn which species are being affected in Missouri. Seven species were identified. They are: Big Brown 55 specimens, Red 21, Hoary 6, Evening 6, Eastern Pipistrelle 3, Little Brown 2, Silver-Haired 2, and Indiana 1 specimen. Three of the Big Brown and one of the Hoary bats were positive. The other five positive bats in Missouri were tested at the state public health laboratories in Poplar Bluff and Springfield. Collection of species-specific information over time will provide valuable data, which will assist in the evaluation of the need for post-exposure rabies treatment after bat exposure.

Bureau of Communicable Disease Control 1996 Annual Report

Michael Fobbs, B.A.
Bureau of Communicable Disease Control

Cryptosporidiosis was made reportable in Missouri effective April 30, 1996. There were 35 cases of cryptosporidiosis reported in 1996. The largest number of cases (14, or 40.0%) was reported from the Southeastern Health District during a period of enhanced surveillance of nursing home populations for cryptosporidiosis. The Eastern Health District reported the second highest number of cases (10, or 28.6%) during normal surveillance. All reports were individual cases; there were no reported outbreaks of cryptosporidiosis during 1996.

Enteric Disease

There were 74 *E. coli* O157:H7 cases reported during 1996, a 54.2 percent increase over the 48 cases reported in 1995. The number of reported cases increased in all districts except the Central Health District. The highest number of cases (29, or 39.2%) was reported from the Eastern Health District, possibly due to the fact that St. Louis Children's Hospital routinely tests for this pathogen. The second highest number of cases (15, or 20.3%) was reported from the Southwestern Health District where St. John's Regional Health Center in Springfield also routinely tests for *E. coli* O157:H7, and where efforts have been made to educate laboratory staff and hospitals about *E. coli* as a cause of diarrheal illness. See Figure 1. *E. coli* infection was made reportable in Missouri in mid-1992, and 1996 is the fourth complete year of reporting. By 1998, with more than five years of data available, the analysis of trends for this disease will be more meaningful. There is still significant under-detection and under-reporting of this pathogen in Missouri, which prospective studies in other states have found to be more common than *Shigella*.[1]

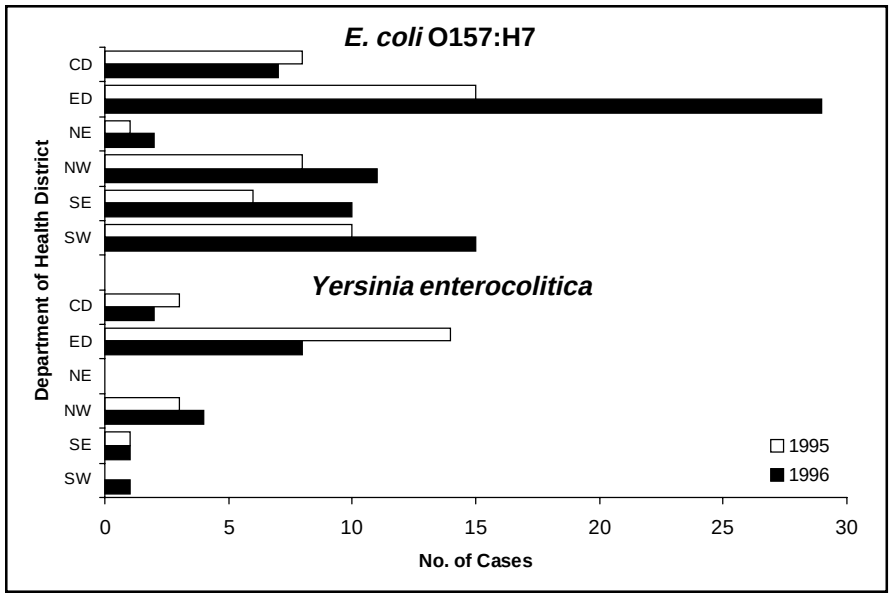

Figure 1. Reported *E. coli* O157:H7 and *Yersinia enterocolitica* cases by Department of Health District, Missouri, 1995 and 1996.

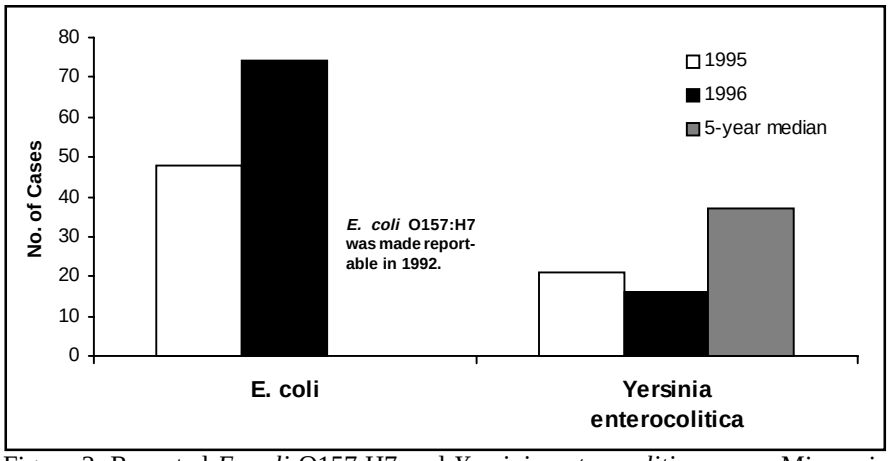

Figure 2. Reported *E. coli* O157:H7 and *Yersinia enterocolitica* cases, Missouri, 1995, 1996 and five-year median.

The number of reported cases of campylobacter infection decreased from 601 cases in 1995 to 554 cases in 1996, a decline of 7.8 percent. The Northeastern Health District showed an increase in the number of reported cases, the Southeastern Health District showed no change and the other health districts all showed decreases. See Figure 3. The

Key to Department of Health Districts:

CD = Central Health District
ED = Eastern Health District
NE = Northeastern Health District
NW = Northwestern Health District
SE = Southeastern Health District
SW = Southwestern Health District

1996 incidence was 9.8 percent below the five-year median* of 614 cases. See Figure 4.

The number of reported cases of salmonellosis fell 2.0 percent from 577 cases in 1995 to 565 cases in 1996. There was a large decrease (23.4 %) in the number of cases reported from the Southeastern Health District, and a large increase (24.3 %) in the number of cases reported from the Southwestern Health District. All other health districts showed a decrease in the number of cases reported in 1996. See Figure 3. The 565 cases reported in 1996 were 2.0 percent below the five-year median of 577 cases. See Figure 4. The most common serotypes of salmonella reported in 1995 and 1996 are shown in Table 1 on page 29.

Reported cases of shigellosis decreased dramatically by 66.0 percent in 1996, from 1,138 cases in 1995 to 387 cases in 1996. Decreases in the number of cases reported were seen in the Northwestern Health District (a 79.6 percent reduction), the Eastern Health District (a 68.1 percent reduction), the Central Health District (a 62.5 percent reduction) and the Southwestern Health District (a 56.8 percent reduction). These four districts went from a total of 1,064 cases reported in 1995 to 300 cases in 1996. The number of reported cases from the Northeastern Health District increased from 8 to 22 reported cases in 1996. The Southeastern Health District showed little change from 1995 to 1996. The 1996 incidence was 42.6 percent lower than the five-year median of 674 cases. See Figure 4.

The number of reported cases of *Yersinia enterocolitica* decreased 23.8 percent from 21 cases in 1995 to 16 cases in 1996. The 1996 incidence was 56.8 percent below the five-year median of 37 cases. See Figure 2. As in the past, the largest number of cases was reported among black children in the Eastern and Northwestern health districts. See Figure 1.

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* The five-year median was calculated using the annual totals from 1991–95.

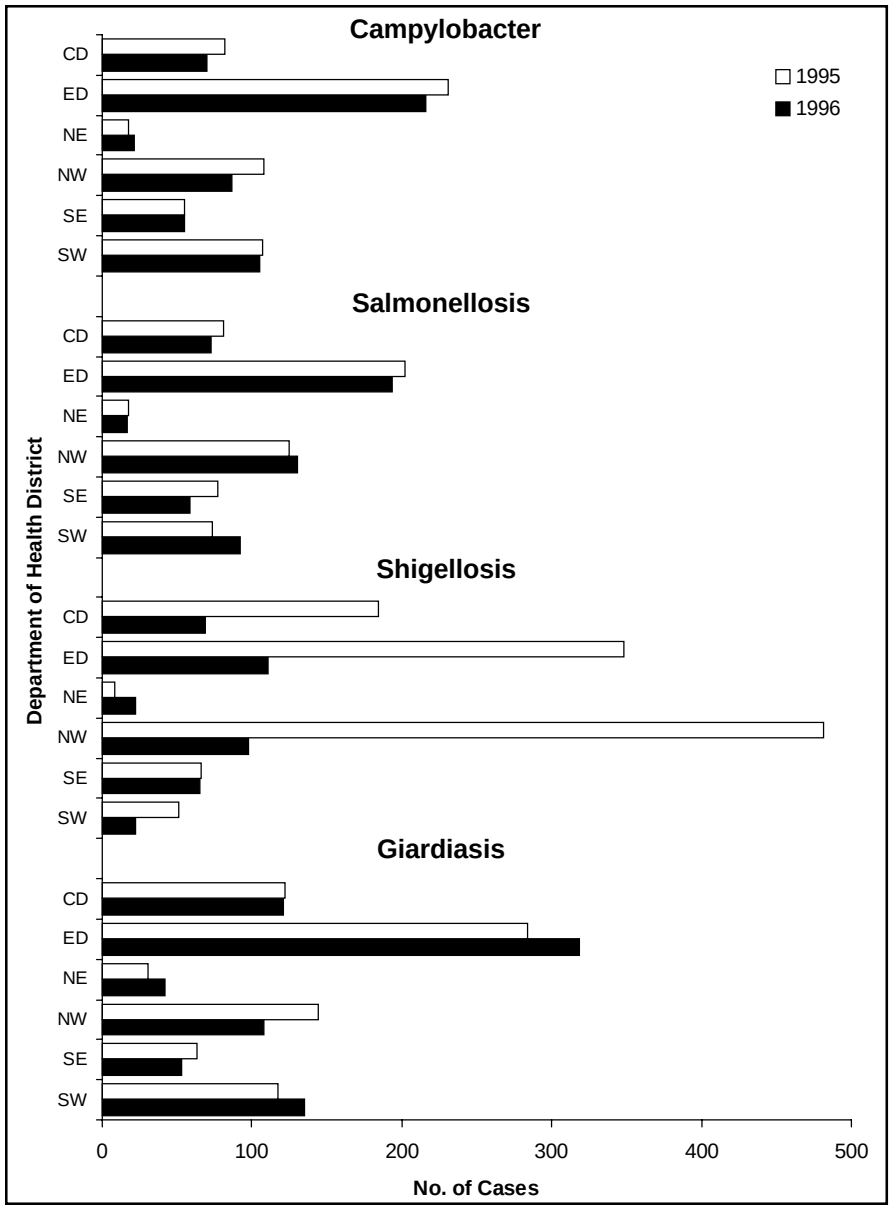

Figure 3. Reported campylobacter, salmonellosis, shigellosis and giardiasis cases by Department of Health District, Missouri, 1995 and 1996.

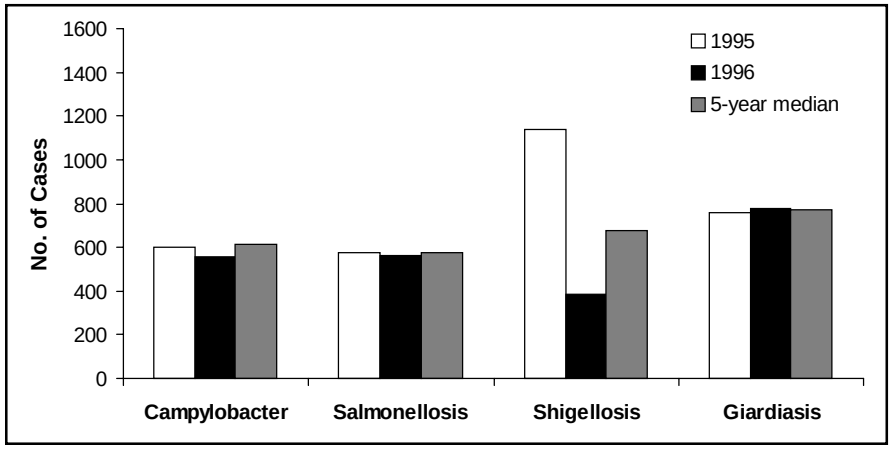

Figure 4. Reported campylobacter, salmonellosis, shigellosis and giardiasis cases, Missouri, 1995, 1996 and five-year median.

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Parasitic Disease

Giardiasis is one of the few other parasitic diseases which the Department of Health routinely tracks through its surveillance system. Reported cases of this disease increased slightly by 2.1 percent, from 761 cases in 1995 to 777 cases in 1996. The numbers of cases reported from the Eastern, Northeastern and Southwestern health districts all increased, but the numbers reported from the Northwestern and Southeastern health districts decreased during 1996. There was only a slight decrease in the number of cases reported from the Central Health District. See Figure 3. The 1996 incidence was 0.9 percent above the five-year median of 770 cases. See Figure 4.

Viral Hepatitis

Hepatitis A in Missouri increased by 5.7 percent from 1,338 reported cases in 1995 to 1,414 cases in 1996. The largest number of cases, 629 (44.5%) was reported from the Southwestern Health District, an increase of 395.3 percent over the 127 cases reported in 1995. Increases in the number of cases reported were also seen in the Northeastern and Southeastern health districts. A large decrease was seen in the Central and Northwestern health districts, and a small decrease was seen in the Eastern Health District. See Figure 5. The 1996 incidence was 5.7 percent above the five-year median of 1,338 cases. See Figure 6.

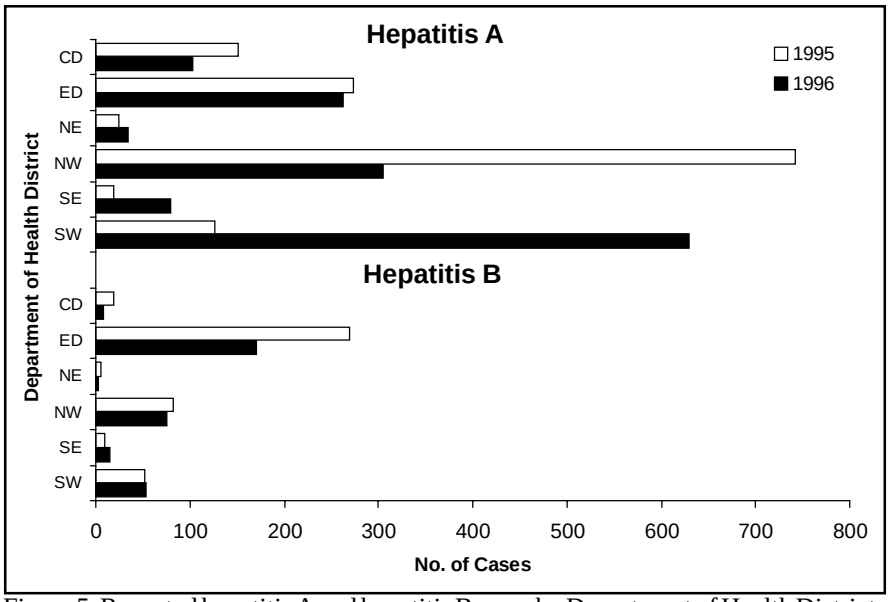

Figure 5. Reported hepatitis A and hepatitis B cases by Department of Health District, Missouri, 1995 and 1996.

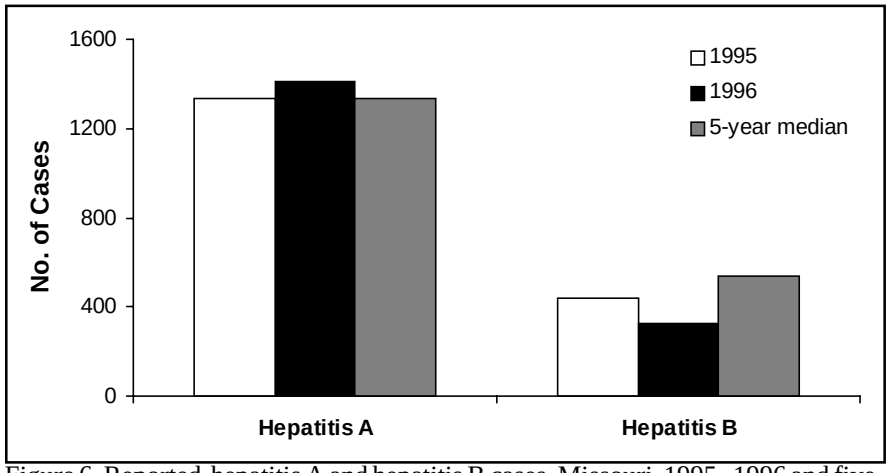

Figure 6. Reported hepatitis A and hepatitis B cases, Missouri, 1995, 1996 and five-year median.

Only 71 (5.0%) of the 1,414 hepatitis A cases reported in 1996 were associated with outbreaks. (See separate article regarding outbreaks on pages 8–9.) The majority of the cases reflect ongoing transmission of this disease in large areas of the state.

Hepatitis B cases decreased by 25.4 percent, from 437 cases reported in 1995 to 326 cases in 1996. Two health districts, Southeastern and Southwestern, had slight increases in the number of cases reported in 1996. All the other health districts showed decreases in the number of reported cases. See Figure 5. The 1996 incidence was 39.4 percent lower than the five-year median of 538 cases. See Figure 6.

Meningococcal Meningitis and Other Invasive Meningococcal Disease

There was a 5.5 percent increase in the number of reported cases of meningococcal meningitis, from 54 cases in 1995 to 57 cases in 1996. This is the sixth year of increasing incidence. The Eastern, Northwestern and Central health districts all had increases in the number of reported cases in 1996. See Figure 7. The largest numbers of cases reported were from the health districts that include the state's two major metropolitan areas: 27 cases from the Eastern Health District and 14 cases from the Northwestern Health District. The 1996 incidence was 54.1 percent above the five-year median of 37 cases. See Figure 8.

Other invasive meningococcal disease increased by 86.4 percent from 22 reported cases in 1995 to 41 cases in 1996. The numbers of cases reported increased in all health districts except the Northwestern and Southwestern. The number of cases reported from the Southeastern Health District went from 2 cases in 1995 to 12 cases in 1996. Data on other invasive meningococcal disease has only been collected since 1994.

Aseptic Meningitis

Aseptic meningitis decreased by 55.4 percent from 269 reported cases in 1995 to 120 cases in 1996. See Figure 8. Decreases in the number of reported cases were seen in all health districts. The largest decline occurred in the Southwestern Health District, where reported cases decreased by 83.3 percent (78 to 13 cases). See Figure 7. The 1996 incidence was 56.4 percent lower than the five-year median of 275 cases.

Aseptic meningitis is a disease of unknown etiology with many different causes. Surveillance of clusters/outbreaks of this disease is important because of the need to determine the causative organisms and transmission modes.

Haemophilus influenzae type b (Hib) Disease

There were no cases of Hib meningitis reported in 1996. Ten cases were reported in 1995 and seven cases in 1994. The 1996 incidence was 100 percent lower than the five-year median of 12 cases. See Figure 8.

Reported cases of invasive Hib disease other than meningitis decreased by 55.5 percent, from 18 cases in 1995 to 8 cases in 1996. See Figure 8. The number of reported cases decreased in all health districts, except the Central and Northeastern. See Figure 7. The 1996 incidence was 81.8 percent below the five-year median of 44 cases. Reported cases of invasive Hib disease other than

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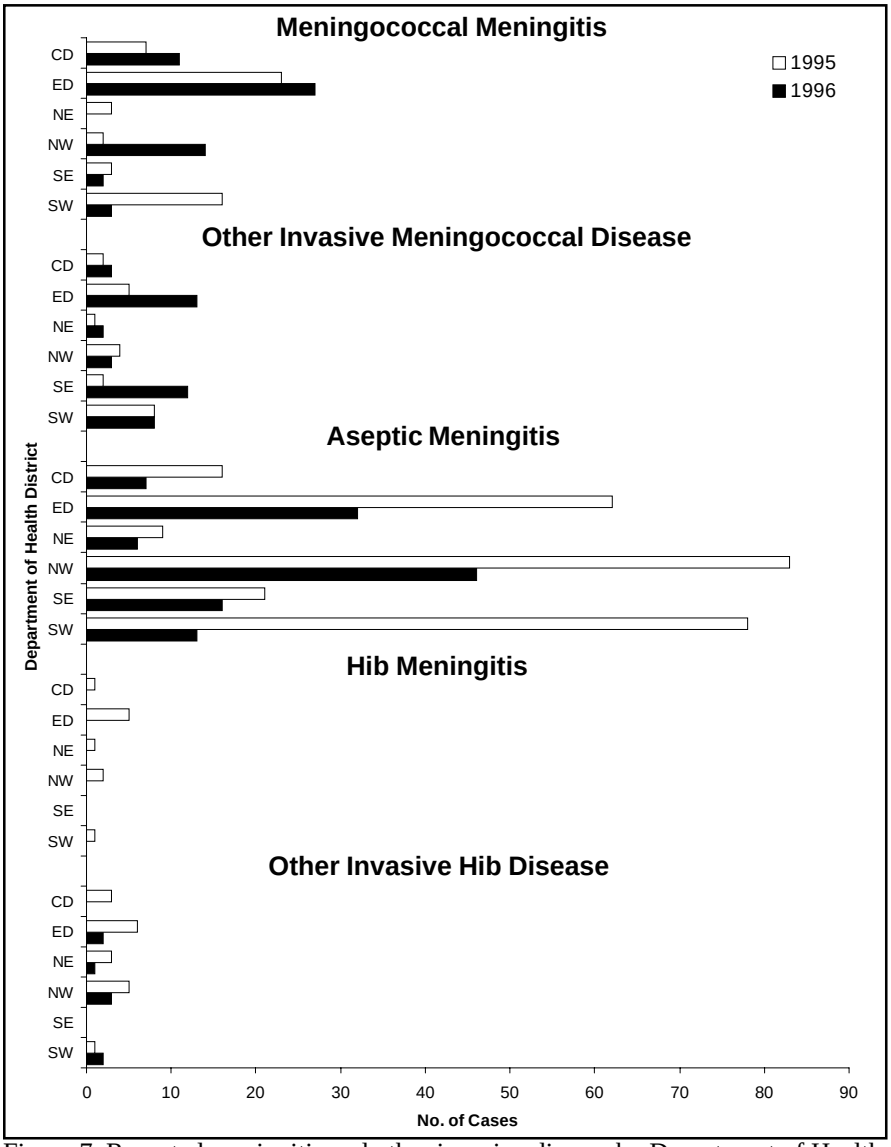

Figure 7. Reported meningitis and other invasive disease by Department of Health District, Missouri, 1995 and 1996.

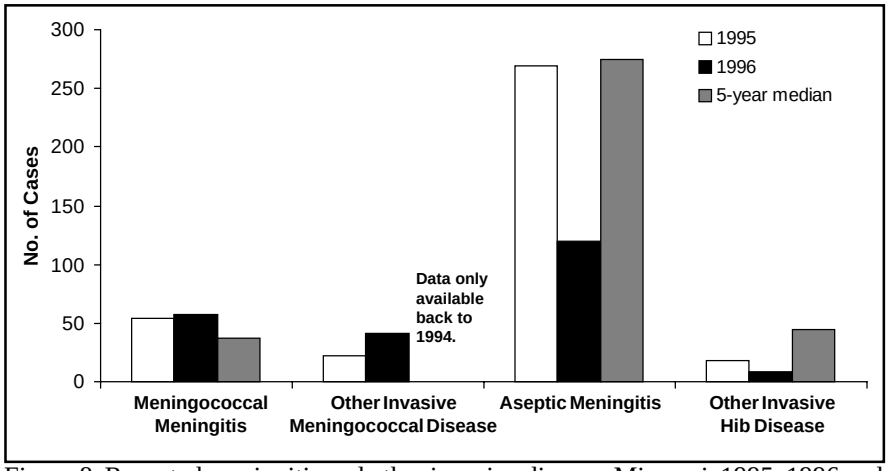

Figure 8. Reported meningitis and other invasive disease, Missouri, 1995, 1996 and five-year median.

1996 Outbreaks of Communicable Disease*

Michael Fobbs, B.A.
Bureau of Communicable Disease Control

In 1996, there were 40 communicable disease outbreaks reported in Missouri. This represents a 20.0 percent decrease from the 50 outbreaks reported in 1995. However, the 40 outbreaks reported in 1996 affected 1,627 people, compared to 880 persons affected by the 50 outbreaks reported in 1995. The outbreaks in 1996 involved several different modes of transmission and a number of widely varying etiologic agents, and they occurred in a variety of settings. The modes of transmission were as follows: 27 outbreaks were suspected to have resulted from person-to-person transmission, 11 were foodborne, one was waterborne, and in one outbreak the mode of transmission was aerosolization of sump water.

Communities and correctional institutions were the most common settings for outbreaks reported in 1996, each accounting for eight (20.0%) outbreaks. Schools and restaurants were the second most common locations, accounting for seven outbreaks (17.5%) each. Day care settings were involved in six outbreaks (15.0%) and two outbreaks (5.0%) occurred in camps (including the annual Rainbow Family Gathering) . Individual outbreaks occurred in a bar and a group home (2.5% each). The largest single occurrence was an outbreak of influenza-like illness in a school affecting 1,050 people. Table 1 lists the communicable disease outbreaks that occurred in 1996 by etiology, setting and number of cases.

The largest proportion of the outbreaks reported during 1996 was involved acute gastrointestinal illness of unknown etiology (AGI), with eleven outbreaks affecting 245 people. Foodborne transmission was the most common mode, being implicated in nine (81.8%) of these outbreaks. The other two AGI outbreaks were the result of person-to-person transmission. AGI outbreaks occurred in the following settings: five restaurants, three schools, two institutions and one group home. Viral etiology is suspected for these outbreaks but laboratory confirmation was not possible.

Outbreaks due to bacterial enteric diseases (regardless of etiology) were very common during 1996. Nine outbreaks were associated with these

Table 1. Communicable disease outbreaks by etiology, setting and number of cases, Missouri, 1996.

Disease/ Mode of Transmission	No. of Outbreaks	Setting	No. of Cases
Acute Gastrointestinal Illness of Unknown Etiology			
Foodborne	9	I, O, 5R, 2S	145
Person-to-Person	2	I, S	100
Shigellosis			
Person-to-Person	4	3DC, S	56
Waterborne	1	CA	68
Hepatitis A			
Foodborne	1	R	4
Person-to-Person	4	3C, S	67
Giardiasis	5	2C, 3DC	33
Scabies	5	4I, S	36
Salmonellosis			
Foodborne	1	C	6
Person-to-Person	1	C	37
Infuenza-like	1	S	1,050
Chickenpox	1	I	7
Fifth Disease	1	DC	6
Legionellosis			
Airborne	1	O	4
Meningococcal Disease	1	I	3
E. coli O157:H7	1	C	3
Vibrio damsela			
Foodborne	1	R	2
TOTAL	**40**		**1,627**

Key:
C Community
CA Camp
DC Day Care
I Prison or Other Correctional Institution
O Other
R Restaurant
S School

* Does not include outbreaks related to sexually transmitted diseases, tuberculosis, vaccine-preventable diseases and zoonotic diseases. These disease outbreaks are covered in other articles contained in this issue.

agents. Shigellosis was the causative agent in five (55.6%) of the outbreaks, which affected a total of 124 people. The mode of transmission in all but one outbreak was person-to-person. Settings included three day care centers and one school. The other outbreak was associated with an annual campout of homeless people who used untreated water from streams and creeks in a national park.

Salmonellosis was implicated as the cause in two (22.2%) of the nine enteric outbreaks, affecting a total of 43 people. Both outbreaks were in communities. Mode of transmission for one was foodborne; the second involved person-to-person transmission.

E. coli 0157:H7 was implicated as the cause of a person-to-person transmission of illness among three people in a community outbreak. The other enteric outbreak involved two foodborne cases of *Vibrio damsela* in a restaurant.

Hepatitis A was implicated in five outbreaks affecting a total of 71 people. In four of the outbreaks, transmission of the virus was person-to-person; transmission in the other was foodborne. The settings for these outbreaks were three communities, one school and one restaurant. Missouri experienced a large number of hepatitis A cases (1,414) in 1996. The majority of these cases were not associated with specific outbreaks, but reflected ongoing transmission of this infection in large areas of the state.

There were five outbreaks of giardiasis reported in 1996. These outbreaks affected 33 people, and the mode of transmission in each instance was person-to-person. Settings for the outbreaks included three day care centers and two community-wide events.

Scabies was the causative agent in five outbreaks affecting a total of 36 persons. Four of these outbreaks were in correctional institutions and one occurred in a school. Mode of transmission in each of these outbreaks was person-to-person.

Table 2. Nosocomial disease outbreaks by etiology and number of cases, Missouri, 1996.

Disease/ Mode of Transmission	No. of Outbreaks	No. of Cases
Scabies	15	207
Acute Respiratory Illness of Unknown Etiology	7	283
Acute Gastrointestinal Illness of Unknown Etiology		
Person-to-Person	6	171
Influenza	2	45
Influenza-like	1	56
Multiple Organisms (Associated) Surgical Procedure	1	10
Methicillin-resistant *Staphylococcus aureus*	1	8
Chickenpox	1	3
TOTAL	**34**	**783**

Chickenpox was the causative agent of an outbreak of illness in a correctional institution affecting seven people.

A bar was the setting for an outbreak of Legionellosis affecting four people. Mode of transmission was airborne, related to the aerosolization of sump water.

1996 Nosocomial Disease Outbreaks

Hospitals, nursing homes and other health-care facilities in Missouri reported 34 health care-associated (nosocomial) outbreaks of communicable disease in 1996. This compares with 33 nosocomial outbreaks reported in 1995. The 34 outbreaks reported in 1996 affected a total of 783 people. The 33 outbreaks reported in 1995 affected a total of 810 people.

Mode of transmission in all nosocomial outbreaks was person-to-person. Table 2 lists these outbreaks by etiology and number of cases.

Scabies accounted for 15 (44.1%) of the 34 outbreaks, affecting a total of 207 people.

Acute respiratory illness of unknown etiology accounted for outbreaks in seven facilities, affecting a total of 283 people.

Acute gastrointestinal illness of unknown etiology accounted for six of the outbreaks, affecting a total of 171 persons.

Two confirmed type A influenza outbreaks affecting 45 people, and an outbreak of influenza-like illness affecting 56 people, were reported.

Eight cases of methicillin-resistant *Staphylococcus aureus* were reported in an outbreak in one facility.

One facility outbreak involved three cases of chickenpox. An outbreak involving several organisms associated with a surgical procedure performed on ten individuals occurred at another facility.

Tick-Borne Disease Summary - 1996

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Rocky Mountain Spotted Fever

Rocky Mountain Spotted Fever (RMSF) is characterized by sudden onset of symptoms including headache, conjunctivitis, peripheral and periorbital edema, chills, fever lasting two to three weeks, myalgia and a maculopapular rash usually appearing on the second to sixth day. The rash is the most characteristic and helpful diagnostic sign. It usually appears first on the wrists and ankles and may include the palms and soles, spreading centripetally to the rest of the body. If treatment is delayed, petechiae and purpuric skin lesions are common. Health professionals are encouraged to investigate the possibility of tick exposure when diagnosing illnesses in patients presenting with these symptoms. The infectious agent of RMSF is *Rickettsia rickettsii*. Even though dogs, rodents and other small animals may harbor the rickettsiae, the principle vector and reservoir is the tick.

Ninety percent of the rickettsial diseases that occur annually in the United States are RMSF. During the 1980s, approximately 50 deaths per year were attributed to RMSF. An endemic focus for RMSF exists in Missouri, Arkansas, Oklahoma and Texas.

An analysis of Missouri's RMSF cases over the past 15 years (1982–96) continues to show a yearly average of 25 reported cases. The 19 cases reported in 1996 fall slightly below that average. The highest number of cases, 54, was reported in 1988. Since 1988, the number of cases reported per year has declined, probably due to the normal cycling of disease. Better diagnostic procedures are allowing for early diagnosis of cases, and antibiotic treatment is very effective. The severity of RMSF cannot be discounted, as five deaths in the past ten years in Missouri have been attributed to RMSF. Figure 1 shows the total number

Personal Protection Against Tick-Borne Diseases

- Avoid known tick-infested areas.
- Apply repellents such as diethyltoluamide (DEET) and dimethylphthalate to clothing and exposed parts of the body. (These repellents are active ingredients in many popular insect repellents. Read and follow label directions.)
- Wear clothing that interferes with tick attachment (boots, full length and one-piece outer garments).
- Avoid sitting on grass and logs where exposure to ticks increases.
- Every four to six hours, inspect entire body, including scalp, arm pits and groin, to detect and remove attached ticks.

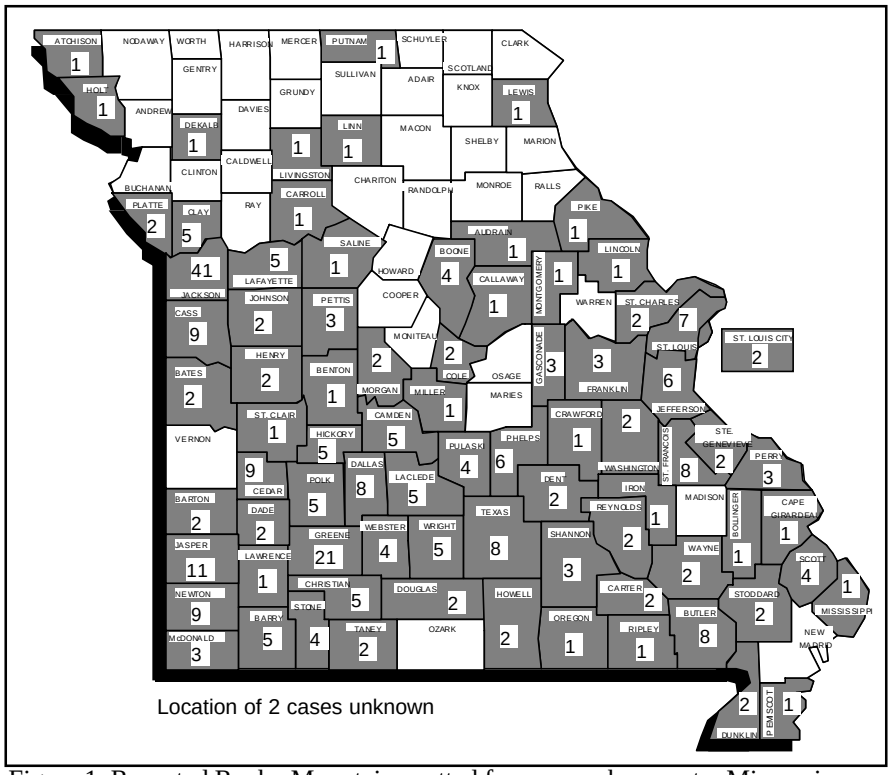

Figure 1. Reported Rocky Mountain spotted fever cases by county, Missouri, 1987–96.

of RMSF cases reported in Missouri by county from 1987–96.

Tularemia

Tularemia is a disease of man and animals caused by the bacteria *Francisella tularensis*. Tularemia is also called rabbit fever and deerfly fever. Tularemia is enzootic in animals throughout the continental United States and in most areas of the world between 30 to 71 degrees north latitude. Based on biogeographic epidemiology, Missouri lies in one of the two recognized tularemia regions in the North American continent. This region, called the Ozark Plateau, encompasses portions of Missouri, Arkansas, Oklahoma and Kansas.

This oldest tick-borne disease in Missouri has declined from an average of 35 cases per year over the past 15 years to a record low of only 9 cases reported in 1996. Missouri had 58 cases of tularemia reported in 1987, and the number of cases has declined yearly to its present low. A direct explanation of the low number of cases reported in 1996 is not possible as there are many factors that affect the organism, the vector and the host. Variation of all these factors produce cycles in disease incidence. At the present time, tularemia is at a low ebb.

Most tularemia cases in Missouri occur south of the Missouri River. Figure 2 shows the total number of cases reported in Missouri by county from 1987–96.

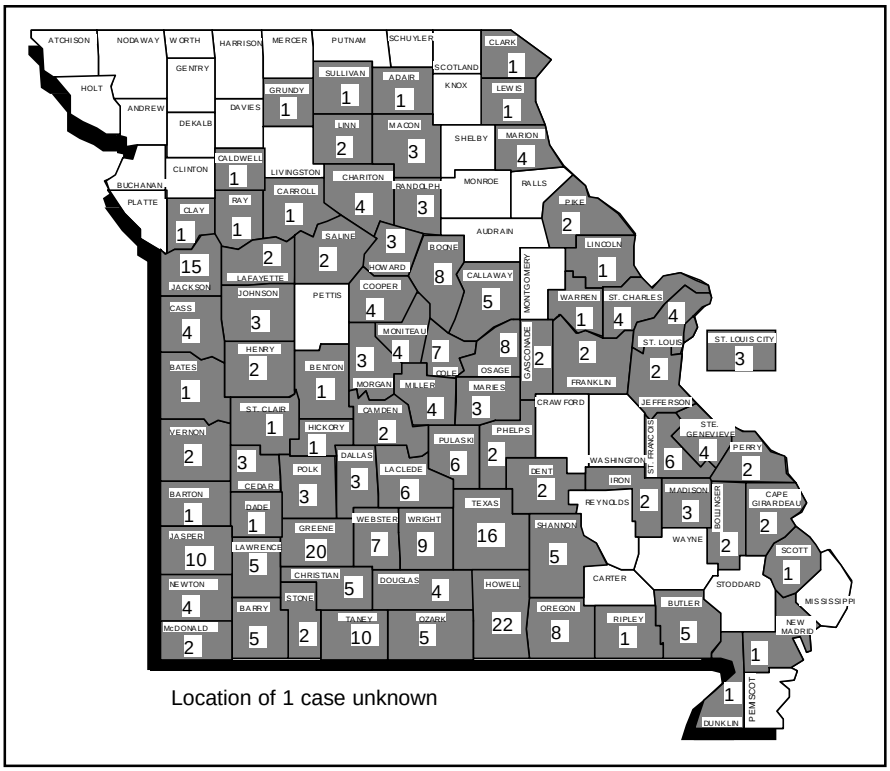

Figure 2. Reported tularemia cases by county, Missouri, 1987–96.

Ehrlichiosis

Ehrlichiosis is an acute febrile illness of humans caused by *Ehrlichia chaffeensis* and thought to be transmitted by the brown dog tick, *Rhipicephalus sanguineus*. As with other tick-borne diseases, it has an acute onset with flu-like symptoms including headache, myalgia, anorexia, nausea and, in some instances, a rash. Clinical laboratory abnormalities include leukopenia, thrombocytopenia and elevated levels of hepatic aminotransferase.

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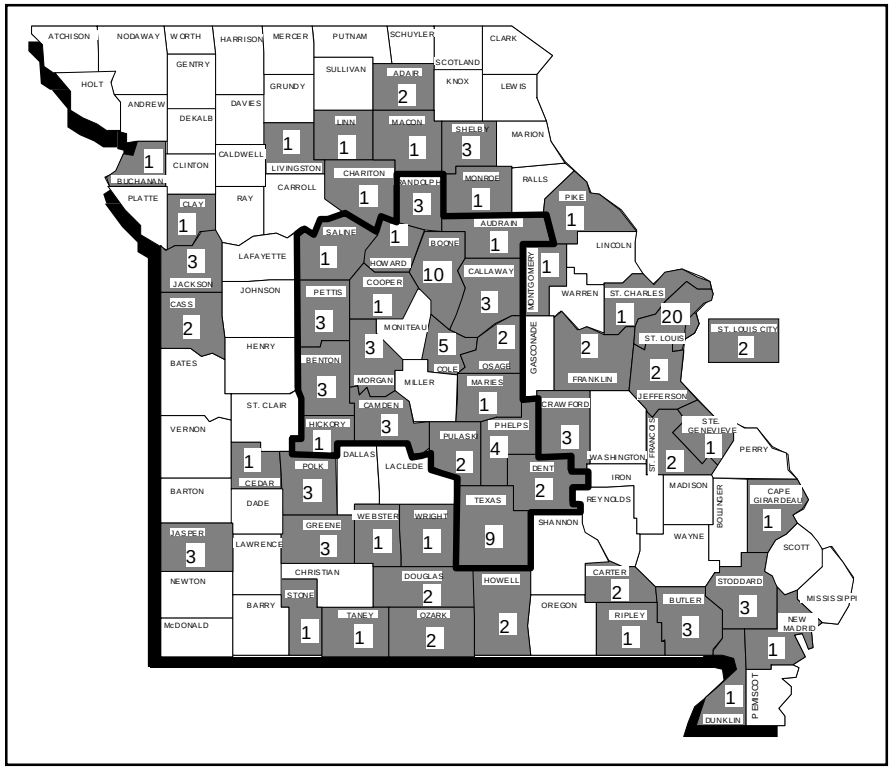


Figure 3. Reported ehrlichiosis cases by county, Missouri, 1988–96.

Environmental Prevention Against Tick-Borne Diseases

- Keep weeds and grass cut in yards and recreational areas.
- Clear brush along paths.
- Remove ticks from pets to minimize the tick population in areas near residences.

(continued from page 11)

A total of 142 human ehrlichiosis infections were reported in Missouri since 1988, or an average of 15 cases per year. Missouri continues to account for the majority of the ehrlichiosis cases reported nationally, with central Missouri being the epicenter of the state (outlined in Figure 3 on page 11). The 36 central counties accounted for over 54 cases reported from 1988–96. See Figure 3.

Figure 4 shows the distribution by county of the 32 ehrlichiosis cases reported in Missouri in 1996.

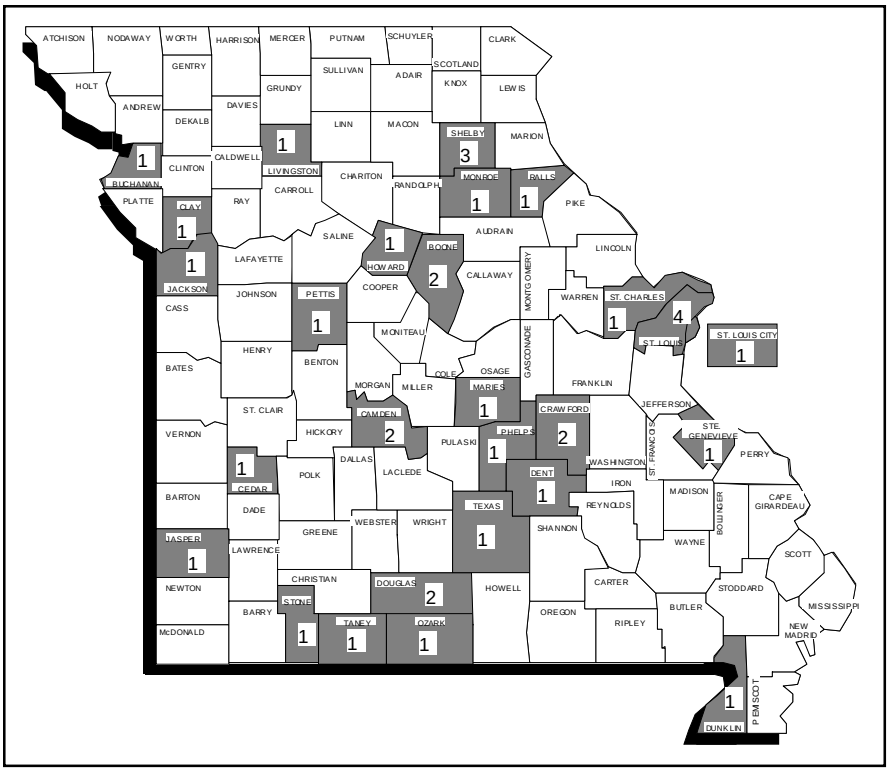


Figure 4. Reported ehrlichosis cases by county, Missouri, 1996.

Borreliosis

Borreliosis is a bacterial illness transmitted by ticks to wildlife and man. Borreliosis has become the most commonly reported vector-borne disease in the United States with as many as 90 percent of all cases being reported from the northeastern United States. The tick most commonly reported as the vector for Lyme disease is *Ixodes scapularis* (formerly *Ixodes dammini*). *I. scapularis* is not common in Missouri. Other possible vectors in Missouri include *Amblyomma americanum* (the Lone Star tick) and *Dermacenter variabilis* (the American dog tick).

There were 52 cases of borreliosis reported in Missouri in 1996 that met the case criteria set by the Centers for Disease Control and Prevention and the Council of State and Territorial Epidemiologists. Figure 5 shows the number of borreliosis cases reported in Missouri in 1996 by county.

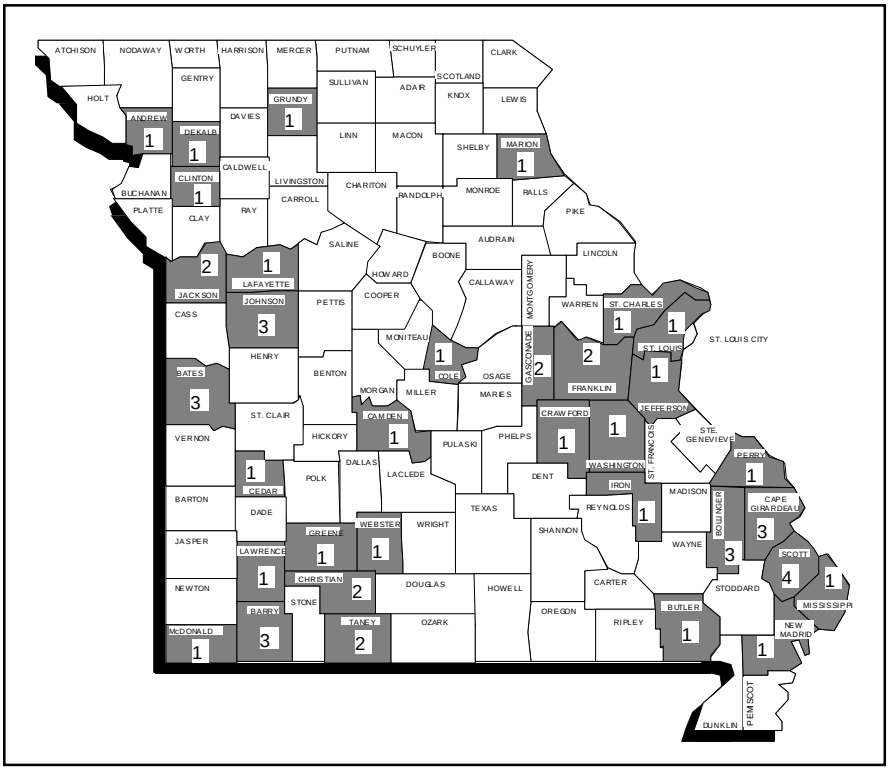


Figure 5. Reported borreliosis cases by county, Missouri, 1996.

Bureau of Environmental Epidemiology 1996 Annual Report

Brian M . Quinn
Bureau of Environmental Epidemiology

The Bureau of Environmental Epidemiology (BEE) is one of the Missouri Department of Health's most diverse units. From risk and health assessment to epidemiological studies, from occupational fatality investigation to childhood lead poisoning prevention, BEE serves Missourians through a wide variety of environmental health programs. Even though BEE is diverse, the bureau is singular in its purpose—to protect the health and well-being of all Missourians.

BEE Risk Assessment Programs

BEE's two risk assessment programs are heavily involved in assessing the risk that hazardous substances in the environment pose to human health. These programs work closely with other state and federal environmental and health agencies, including the U.S. Environmental Protection Agency (EPA), the Missouri Department of Natural Resources (DNR), the federal Agency for Toxic Substances and Disease Registry (ATSDR), the Department of Defense (DOD) and the Department of Energy (DOE). These programs assess human risk through several different kinds of documents that discuss exposure levels, safe clean-up levels and various aspects related to exposure to hazardous substances found at hazardous waste sites statewide. An EPA-funded risk assessment involves a quantitative analysis or review of information about a hazardous waste site. This kind of assessment provides a mathematical "best guess" of what will happen if the site is not cleaned up or if the site is only cleaned up to a specific level of contamination, rather than a safe (walk away) level. A state-funded risk assessment provides more generic clean-up guidelines for sites, based on similar but not identical assumptions/formulae in contrast to EPA numbers. The information given in the following two subsections reflect research, cooperation, coordination, document review and interagency communication by BEE staff.

Risk Assessment Program (EPA)

- Completed three site-specific human health risk assessments.
- Completed one site-specific ecological risk assessment.
- Developed safe ambient air levels for one site.
- Developed safe residual soil levels for one site.
- Reviewed four risk assessments (from other agencies).
- Determined remedial goals for four sites.
- Attended five training courses.
- Gave one presentation to citizens and a citizens advisory committee.
- Maintained effective communication and working relationships with numerous local, state and federal agencies and organizations.

For more information, contact the program at (800) 392-7245.

Risk Assessment Program (State)

- Reassessed 53 abandoned or uncontrolled hazardous waste sites for their risk to public health.
- Analyzed 21 sites to determine if private drinking water wells were impacted by nearby contamination.
- Continued assisting DNR by reassessing the health risks at five DOD sites. One is an active Air Force base; the other sites are inactive, but are being cleaned up for future use.
- Provided health information to DNR to assist with its Voluntary Cleanup Program. Forty of these sites are already cleaned up, while 120 more properties are in the process of cleanup.
- Completed six clean-up assessments on sites other than abandoned or uncontrolled hazardous waste sites.
- Assisted DNR in developing a guidance document for their Brownfield Redevelopment Program.
- Provided consultative services to DNR's Air Pollution Control Program regarding acceptable ambient air levels at 25 sites.

For more information, contact the program at (800) 392-7245.

Public Health Assessment Program (ATSDR)

The Public Health Assessment Program is part of a state cooperative agreement with ATSDR to conduct health assessments in Missouri communities near hazardous waste sites. In contrast to EPA and state risk assessments, public health assessments provide a qualitative evaluation of exposures to contaminants at a site and related adverse health effects that could have occurred in the past, are presently occurring, or could occur in the future. These health effects are evaluated by estimating exposures based on interviews with citizens, community and elected leaders, etc., or based on review of documents such as risk assessments, site histories and any other available information about a site. Findings from these assessments are reported through different types of documents including public health assessments, site review and updates, health consultations and site summaries. These documents are designed to inform and educate the communities about sites, and help them make decisions about how to protect themselves from exposure to site-related contaminants and resulting adverse health effects. These documents also are used by environmental agencies with regulatory power (e.g., EPA) to help make the most health protective decisions when planning clean-up or remediation actions at a site.

(continued on page 14)

(continued from page 13)
All of these program activities represent a tremendous amount of communication, coordination and cooperation with numerous local, state, and federal departments and agencies required to complete the work summarized in this report. This program has also been heavily involved in numerous other sites and issues which are currently in the early stages of community and government activity and development**.** In 1995, the Public Health Assessment program:

- Completed one public health assessment.
- Completed one health consultation.
- Completed one site review and update.
- Completed one summary document.
- Hosted or attended five public availability sessions.
- Visited 12 hazardous waste sites statewide.
- Coordinated two major multi-agency site enhancement projects.
- Coordinated or participated in two community surveys.
- Prepared four news releases regarding program/bureau activities.
- Participated in five Community Assistance Group meetings.
- Participated in numerous health education group meetings.
- Provided technical assistance to other agencies.

For more information, contact the program at (800) 392-7245.

Missouri Occupational Fatality Assessment and Control Evaluation (MO FACE) Program

This program operates through a cooperative agreement with the National Institute for Occupational Safety and Health (NIOSH). It is responsible for conducting in-depth epidemiological investigations of work-related fatalities including deaths resulting from falls, electrocutions, machinery-related incidents, confined-space incidents and other causes. Occupational Fatality Reports produced from these investigations are shared with NIOSH, the employer involved, and safety groups statewide. The MO FACE program works closely with employers involved in workplace fatalities to help them take steps to prevent similar incidents from happening again. The program is also developing intervention initiatives, such as workshops and seminars, to help employers recognize workplace hazards so they can prevent fatalities before they occur. In 1996, the MO FACE program:

- Completed 10 occupational fatality investigations:
  7 machine-related incidents
  2 falls
  1 electrocution
- Received notification of 319 possible workplace fatalities and determined that 138 were traumatic work-related fatalities**.**
- Created, coordinated and conducted two Fall Protection Workshops for the construction industry (one in Joplin and one in Springfield). Approximately 70 persons attended.
- Gave four presentations to representatives from local, state and federal agencies and to college classes.
- Maintained close working relationships with MO FACE surveillance system participants (114 county coroners, 114 sheriff's departments, 548 police departments, 804 fire departments and 221 ambulance services).

For a copy of the 1996 MO FACE Annual Report, contact the program at (800) 392-7245.

Childhood Lead Poisoning Prevention Program

Childhood lead poisoning is one of the most common preventable environmental health problems in the world today. Its adverse toxic health effects on young children's developing nervous, hematopoietic and renal systems range from acute (coma and seizures) to subtle (learning and behavioral problems or anemia). Children are at greater risk due to hand-to-mouth behaviors that allow ingestion of lead dust. Testing, treatment and prevention of access to lead hazards are key elements to finding and, ultimately, eliminating childhood lead poisoning.

Today, the most frequent cause of lead poisoning in children comes from deteriorating lead-based paint found primarily in older housing. While Missouri has its share of older homes containing lead-based paint, the state also features areas of contaminated soil in vicinities near lead mines and smelters due to its unique role as the largest producer of lead and lead products in the United States.

During 1996, 45,560 Missouri children, less than 6 years of age, were reported as being screened for lead poisoning. This reflects a two percent increase over the number of screenings performed during 1995. However, the number of children found with blood lead elevations ≥10mg/dl (the level at which a child is considered lead poisoned) decreased from 13.9 percent (6,219/44,694 screened) in 1995 to 8.3 percent (3,781/45,560 screened) in 1996.

These data reflect national trends, as reported by Phase 2 of the Centers for Disease Control and Prevention (CDC) National Health and Nutrition Examination Survey (NHANES) III, conducted from October 1991 to September 1994 and summarized in the February 21, 1997 issue of CDC's *Morbidity and Mortality Weekly Report*. At the same time, CDC released a draft of new screening guidelines which propose targeting screening outreach activities based on certain risk factors. These risk factors include the quantity of pre-1950 housing (due to a higher concentration of lead-based paint) and current screening data. Poverty indicators may also be incorporated into the data to assist in identifying areas where children are at increased potential for inhabiting older and deteriorating housing. In Missouri, other useful factors to include are whether parents are employed at lead mines or smelters and/or other lead occupations and hobbies.

According to the 1990 U.S. Census, 27 percent of the housing stock in Missouri was built prior to 1950. Figure 1 shows the percentage of pre-1950 housing by county in Missouri with an overlay of the percentage of children less than 6 years of age who are at or below 100 percent of the poverty level. These indicators identify many counties in Missouri that show a high potential risk of childhood lead poisoning. Smaller geographic boundaries (such as zip codes, census tracts, etc.) identify areas with higher potential risk for lead poisoning. Unfortunately, in many areas of Missouri, inadequate numbers of children are screened, preventing the comparison of risk to reality.

A major function of the Missouri Childhood Lead Poisoning Prevention Program is to increase the number of reported blood lead screenings in order to determine the extent of lead poisoning and its location. Efforts necessary to accomplish this include educating physicians regarding required blood lead screening during 12- and 24-month well-child visits, encouraging private laboratory reporting, and increasing general public awareness through various media sources Future efforts will continue to be more focused on areas identified to have the greatest potential risk to children based on housing, poverty, screening numbers and lead occupations.

Another primary role of the Missouri Childhood Lead Poisoning Prevention Program is to identify the source of lead hazard in the environment for a child with a confirmed elevated blood lead level, then to prevent or eliminate access to the hazard. Home environmental assessments are generally conducted by a public health nurse and sanitarian (trained in lead hazard assessment) who educate the family about specific personal hygiene, such as frequent and thorough handwashing of the child, washing toys, wet mopping to remove lead dust from floors and surfaces where small children play, and good nutrition through a diet high in iron and calcium to prevent bodily absorption of lead.

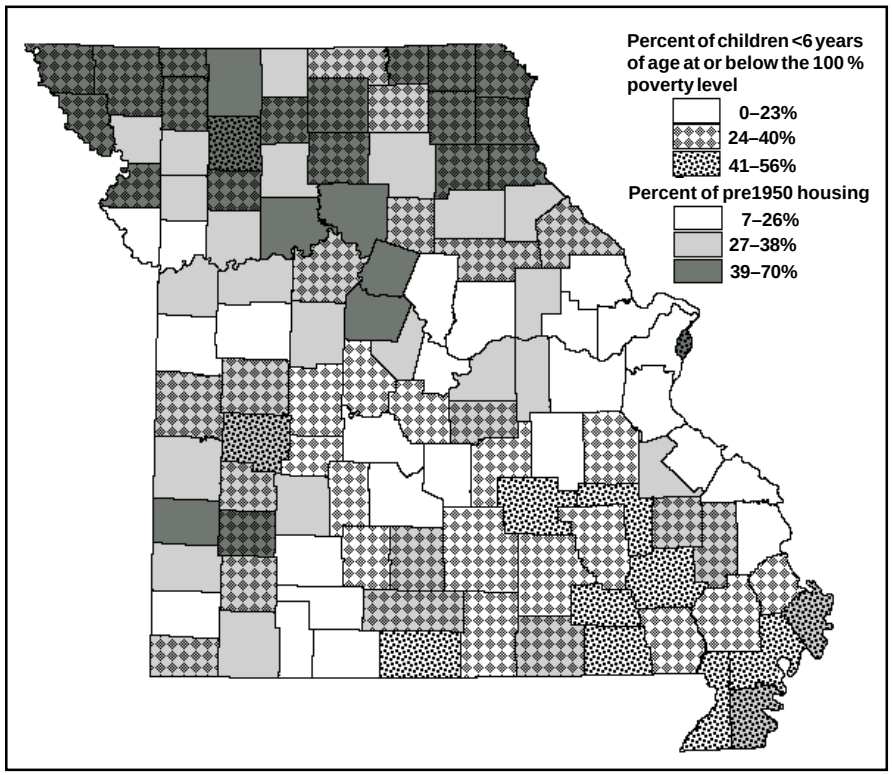


Figure 1. Percent of pre-1950 housing and percent of children <6 years of age at or below the 100 percent poverty level by county, Missouri, 1990.

During 1996, an environmental assessment to detect the source of the lead hazard was conducted for 70.2 percent of all children reported with elevated blood lead levels compared to 51.2 percent done in 1995.

Throughout the state, other lead program efforts include increasing community awareness and involvement in the efforts to eliminate and prevent childhood lead poisoning. Information concerning the level of risk for childhood lead poisoning for local needs assessments play an integral role in this process. For further information, please contact your local health department, or call the Childhood Lead Poisoning Prevention Program at (800) 575-9267.

Missouri Hazardous Substances Emergency Events Surveillance (HSEES) Program

The HSEES program is responsible for monitoring, collecting and interpreting information on emergency events involving the release of hazardous substances (spills, releases, accidents or threats of these). This information is analyzed to provide a clearer picture of how such events affect the health and well-being of Missourians. The results are then used to help protect the public from injury and death caused by exposure to hazardous substance releases.

During 1996, this program investigated 298 potential hazardous substances emergency events and identified 161 as meeting the case definition.

This program's complete annual report may be found on pages 30–32 of this issue. For more information, contact the program at (800) 392-7245.

Environmental and Occupational Diseases and Conditions Passive Surveillance System

The bureau maintains this passive surveillance system to document

(continued on page 16)

(continued from page 15)
occupational diseases and health conditions which are required to be reported to the Department of Health by 19 CSR 20-20.020 and 19 CSR 20-20.080. In 1996, the surveillance system received reports on 13,038 cases of environmental and occupational diseases and conditions. This number does not include cases of lead poisoning in children under 6 years of age, which are tracked by the bureau's childhood lead poisoning prevention program.

The majority of conditions reported in 1996 were lead poisoing in adults (11,385 reports), lead poisoning in 6 to 17-year-olds (1,504 reports), acute chemical poisoning (156 cases) and carbon monoxide poisoning (32 cases).

For more information, contact the program at (800) 392-7245.

Radiological Health Program

BEE's Radiological Health Program is responsible for overseeing and regulating sources of ionizing radiation in non-medical settings. These sources are used in many ways, for example in nuclear pharmacies and industrial radiography. The program is also involved in emergency response and environmental radiation activities. Program staff conduct radon surveys statewide and provide radon information through seminars, displays and public awareness presentations. The Radon Hotline provides Missouri residents easy access to radon information. In 1996, the Radiological Health Program:

- Continued to register and reregister ionizing radiation sources used in non-medical settings:
  - 86 industrial radioactive material users
  - 113 x-ray users
- Participated in extensive training activities in preparation for emergency events at the Callaway and Cooper county nuclear plants. Training included drills, dress rehearsals and exercises. This year's Cooper exercise was federally evaluated and the bureau successfully demonstrated the capability to protect public health and safety in the event of a nuclear plant emergency event.
- Participated for the seventh year in an EPA radon grant which provides funding for radon activities concentrated in counties that have a high potential for elevated radon levels. Activities included radon surveys in schools, daycare centers and numerous residences.
- Continued to maintain and cultivate close working relationships with local, state and federal departments and agencies including the American Lung Association, Missouri Association of School Administrators, Missouri Public Health Association and Missouri State Medical Association, as well as with other organizations.
- Presented 12 radon awareness programs at seminars, health fairs and other meetings.
- Provided radon detectors to 24 county and three city health departments for testing in their areas. Distributed more than 1,000 detectors to the public.
- Received approximately 512 phone calls through the Radon Hotline.

For more information, contact the Radon Hotline at (800) 669-7236.

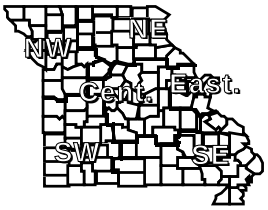
Special Studies

One of BEE's most important functions is to coordinate and conduct special epidemiological studies that are designed to determine whether and to what extent Missourians are exposed to hazardous substances in the environment. These studies require a tremendous amount of time, effort, coordination, planning, financial resources and personnel. A study can take up to two years or longer to complete from inception to the published final report. The following summarizes the bureau's special study efforts in 1996:

The bureau conducted a lead exposure study, funded by ATSDR, in children between the ages of 6 months to 6 years living in the area around the Big River Mine Tailings Site in St. Francois County. The study found that 17 percent of the participants in the study area had elevated blood lead levels, compared to three percent in the control area. Analysis of environmental samples and questionnaire data was completed in 1996. The final report was released to the public on May 27, 1997. If you have questions regarding this study or its availability, please call (800) 392-7245.

The bureau is also conducting a study to determine the exposure of area residents to emissions from the dioxin incinerator in Times Beach, Missouri. The first round of blood samples was collected in September 1995, before the incinerator began operation in March 1996. Blood samples were taken from 76 participants in the study area and 74 participants in a comparison area. The second sampling was performed in July 1996, approximately four months after the incinerator began operation. Second-round blood samples were taken from 75 of the original 76 participants in the study area and from 70 of the original 74 participants in the comparison area. The third and final sampling was conducted June 19–24, 1997.

Analysis of study results showed no increase in blood-dioxin levels between the first and second blood samples in the study population (persons living near the incinerator) or in the comparison population (persons living away from the incinerator). In fact, blood dioxin levels in both populations decreased between the first and second samples. The average tetrachlorodibenzo-p-dioxin (TCDD) concentration in study area participants was 1.81 parts per trillion (ppt) in the first sampling and 1.24 ppt in the second round. The average decrease for that group was .57 ppt. In comparison, the average TCDD in the participants from the comparison area for the first and second rounds were 1.43 and 1.38 ppt, respectively, an average decrease of .05 ppt.



Missouri Department of Health
Division of Environmental Health and Communicable Disease Prevention
QUARTERLY REPORT

Reporting Period *
January - March, 1997

	Districts							KANSAS CITY	ST. LOUIS CITY	ST. LOUIS CO.	SPGFLD GREENE CO.	3 MONTH STATE TOTALS		CUMULATIVE		5 YR MEDIAN
	** NW	NE	CD	SE	** SW	** ED	*** OTHER					1997	1996	FOR 1997	FOR 1996	
Vaccine Preventable Dis.																
Diphtheria	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Hib Meningitis	0	0	0	0	0	0		0	0	0	0	0	0	0	0	3
Hib Other Invasive	0	0	0	0	0	0		0	0	1	0	1	3	1	3	6
Influenza	7	13	9	9	8	8		6	20	105	9	194	132	194	132	163
Measles	0	1	0	0	0	1		0	0	0	0	2	1	2	1	0
Mumps	0	0	0	0	0	0		0	0	0	0	0	0	0	0	9
Pertussis	1	0	1	1	0	3		2	0	2	0	10	3	10	3	7
Polio	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Tetanus	0	0	0	0	0	0		0	0	0	0	0	1	0	1	0
Viral Hepatitis																
A	41	13	12	18	57	31		6	11	6	47	242	241	242	241	196
B	8	0	1	5	5	7		2	10	0	4	42	70	42	70	124
Non A - Non B	0	0	1	1	0	2		0	0	2	1	7	5	7	5	6
Unspecified	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Meningitis																
Meningococcal	2	0	4	4	4	1		1	7	6	0	29	24	29	24	11
Enteric Infections																
Campylobacter	11	2	15	12	9	8		0	1	13	4	75	64	75	64	86
Salmonella	9	2	11	6	6	7		2	8	9	3	63	106	63	106	86
Shigella	12	2	9	18	2	0		2	0	1	1	47	145	47	145	144
Typhoid Fever	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Parasitic Infections																
Giardiasis	13	4	24	11	8	12		1	3	24	5	105	175	105	175	130
Sexually Transmitted Dis.																
AIDS	7	0	10	6	3	9	1	13	24	17	2	92	170	92	170	173
Gonorrhea	74	12	115	77	50	28		444	410	369	0	1579	2217	1579	2217	2929
Prim. & Sec. syphilis	0	1	0	3	1	0		1	13	3	0	22	93	22	93	194
Tuberculosis																
Extrapulmonary	0	0	0	1	0	0	0	1	2	2	0	6	4	6	4	6
Pulmonary	3	0	1	3	1	2	0	6	8	5	2	31	29	31	29	31
Zoonotic																
Psittacosis	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Rabies (Animal)	0	0	0	6	0	0		0	0	0	0	6	8	6	8	4
Rocky Mtn. Sp. Fever	0	0	0	0	1	0		0	0	0	0	1	0	1	0	0
Tularemia	0	0	0	0	0	0		0	0	0	0	0	0	0	0	1

TEAR OUT FOR FUTURE REFERENCE

Low Frequency Diseases

Anthrax
Botulism
Brucellosis - 1
Chancroid
Cholera
Cryptosporidiosis - 5
Encephalitis (infectious) - 1
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease - 1
Legionellosis - 4
Leptospirosis
Lymphogranuloma Venereum
Malaria - 2
Plague
Rabies (human)
Reye Syndrome
Rheumatic fever, acute
Toxic Shock Syndrome - 1
Trichinosis

Outbreaks

Foodborne - 2
Nosocomial - 2
Pediculosis - 1
Scabies - 1
Other
- Acute Respiratory - 1
- Campylobacter - 1
- Chickenpox - 1
- Fifth Disease - 1
- Flu-like - 1
- Influenza - 1
- Rotavirus - 1
- Shigella - 1

*Reporting Period Beginning December 29, 1996, Ending March 29, 1997.
**Totals do not include KC, SLC, SLCo, or Springfield
***State and Federal Institutions

Due to data editing, totals may change.

State Public Health Laboratory - 1996 Annual Report

Metabolic Disease Screening

Infants screened	**77,120**
Presumptive positives:	
PKU	13
Hypothyroidism	978
Galactosemia	12
Sickle Cell	39
Other hemoglobinopathies	1,415

Serology/Virology

HIV Serology	**88,835**
HIV antibody positive	753
Syphilis Serology	**23,739**
Sero-confirmed reactive	1,296
Hepatitis A Serology	**1,705**
Positive	334
Hepatitis B Serology	**6,981**
Positive	118
Measles, Mumps and Rubella (Diagnostic Serologies)	**8,643**
Measles (IgM positive)	3
Mumps (significant rise in titer)	1
Rubella (IgM positive)	0
Prenatal rubella screens	8,595
Nonreactive patients	832
Viral Isolation	**952**
Influenza isolates	83
Enterovirus isolates	11
Herpes isolates	432
Rabies	**2,171**
Positive specimens	26

Microbiology

Enterics	**1,961**
Salmonella	758
Shigella	281
Campylobacter jejuni	32
E. coli O157:H7	63
Parasitology	**2,832**
Ova/parasites found	604
Reference Bacteriology	**1,241**
Francisella tularensis	4
Haemophilus influenzae	13
Neisseria meningitidis	76
Bordetella pertussis	75
DNA Probe for Chlamydia/Gonorrhea	**108,200**
N. gonorrhoeae	1,478
Chlamydia trachomatis	4,920

Environmental Testing

Chemistry	**17,896**
Blood lead samples	11,418
Total analyses	31,872
Blood lead $\geq$20 µg/dL	221
Environmental lead samples	241
Bacteriology—Water	
Private Samples	**11,174**
Coliform positive	2,840
Public Supplies	**61,961**
Coliform positive	2,382
E. coli/fecal coliform positive	311
Swimming Pools	**1,795**
Food/Dairy/Beverage	**3,470**
Excessive bacteria, coliform, yeast and mold	82

Tuberculosis Annual Report for 1996

Vic Tomlinson
Bureau of Tuberculosis Control

The number of tuberculosis cases nationwide continued to decrease in 1996. Reports from the Centers for Disease Control and Prevention (CDC) showed a decrease of 6.7 percent in the number of new tuberculosis cases reported nationwide. The number of cases decreased from 22,860 in 1995 to 21,327 in 1996. The case rate decreased from 8.7 per 100,000 population in 1995 to 8.0 in 1996. This represents the fourth consecutive year that tuberculosis cases have decreased nationally.

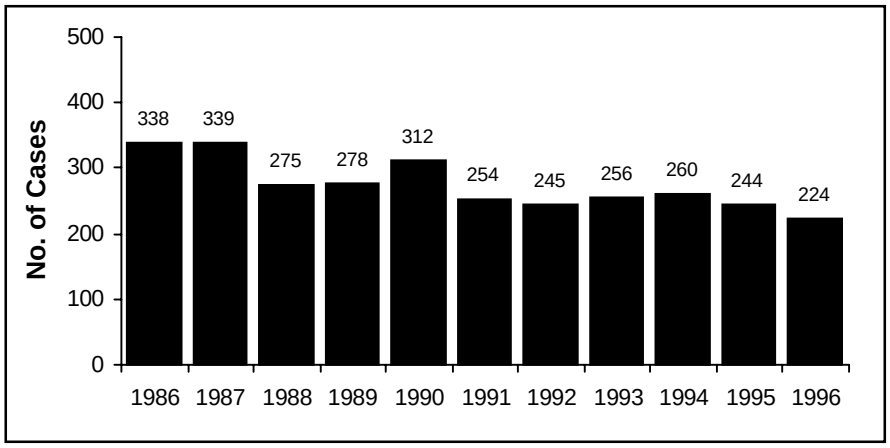


Figure 1. Reported tuberculosis cases by year, Missouri, 1986–96.

Cases of tuberculosis in Missouri also decreased, reaching an all time low of 224 cases in 1996, a case rate of 4.2 per 100,000 population. This represents a decrease of 8.2 percent from the 244 cases reported in 1995. See Figure 1.

The major metropolitan areas accounted for 63 percent of the reported cases in 1996, while the rural or outstate areas accounted for 37 percent. This is a shift compared with 1995, when the major metropolitan areas accounted for 52 percent and 48 percent were reported from the rural or outstate areas. While the total number of reported cases decreased, three of four major metropolitan areas experienced increases in the number of reported cases. St. Louis City increased from 40 to 44 reported cases, Springfield-Greene County increased from 10 to 17 cases and Kansas City increased from 42 to 48 cases. St. Louis City and Kansas City had the highest number of tuberculosis cases of any geographic area of the state, a case rate of 12.3 and 10.8 per 100,000 population, respectively. Springfield-Greene County had a case rate of 11.4 per 100,000. These rates are more than twice the state case rate of 4.2 and higher than the national case rate of 8.0. St. Louis County had a decrease in reported cases from 35 in 1995 to 32 in 1996. See Figure 2.

The outstate area showed a 29.1 percent decrease in the number of cases from 117 reported in 1995 to 83 in 1996. Increases were noted in two of the six

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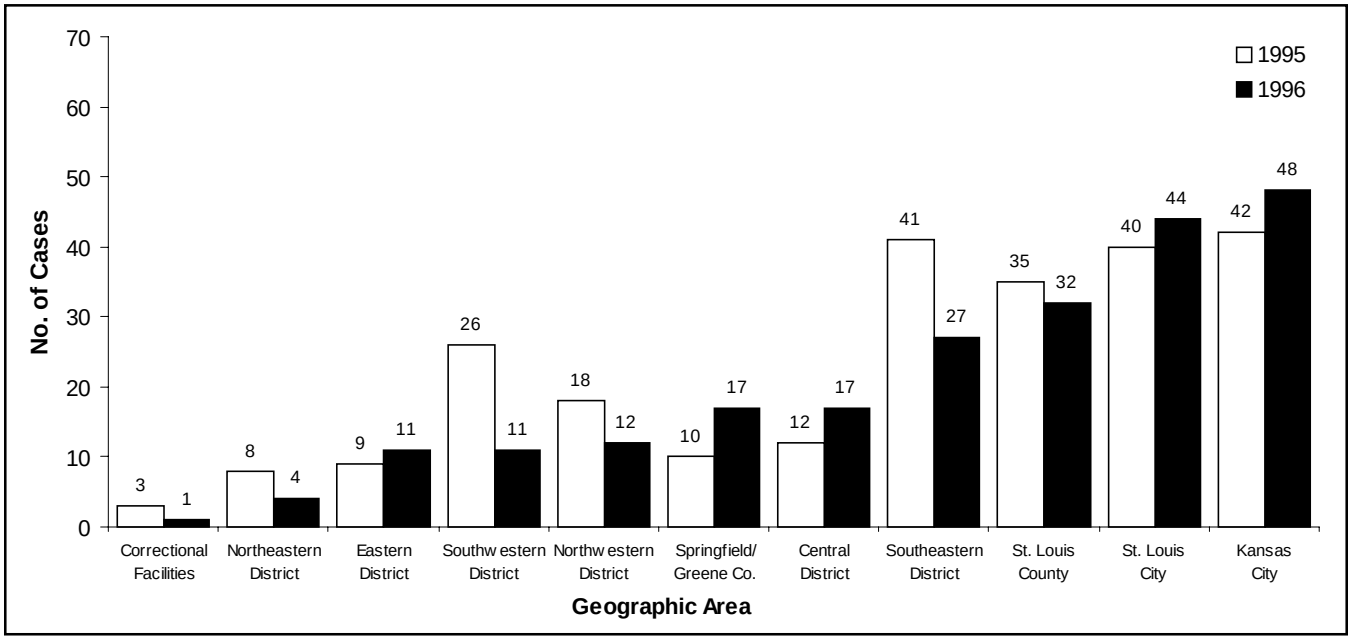

Figure 2. Reported tuberculosis cases by geographic area, Missouri, 1995 and 1996.

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health districts. The Central District increased from 12 to 17 reported cases and the Eastern District increased from 9 to 11 cases. The other health districts experienced decreases with the biggest occurring in the Southwestern District, which decreased 57.7 percent from 26 cases in 1995 to 11 cases in 1996. A decrease was also observed in the state and federal correctional facilities. See Figure 2.

Cases of tuberculosis among males continued to outnumber females. In 1996, 64.7 percent (145) of the cases were male and 35.3 percent (79) were female. In 1995, 61.9 percent (151) were male and 38.1 percent (93) were female.

In 1996, individuals with active disease ranged in age from less than 1 to 95. Increases were observed in the 15–24 age group (from 8 cases in 1995 to 12 cases in 1996) and the 25–44 age group (from 67 cases in 1995 to 69 cases in 1996). All other age groups showed a decrease. Tuberculosis cases for those under age 5 decreased from 4 in 1995 to 3 in 1996. This represents the third consecutive year that early childhood cases have decreased. The largest decrease was among those age 65 and over, from 107 cases (43.9%) in 1995 to 86 cases (38.4%) in 1996. See Figure 3.

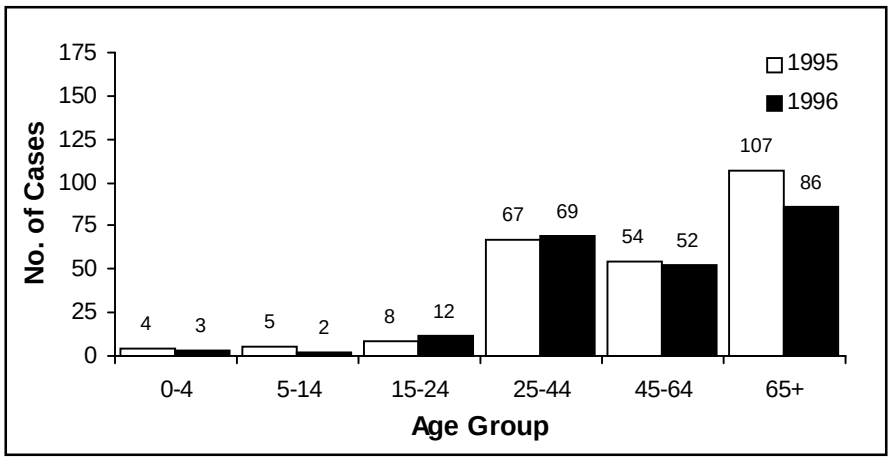

Figure 3. Reported tuberculosis cases by age, Missouri, 1995 and 1996.

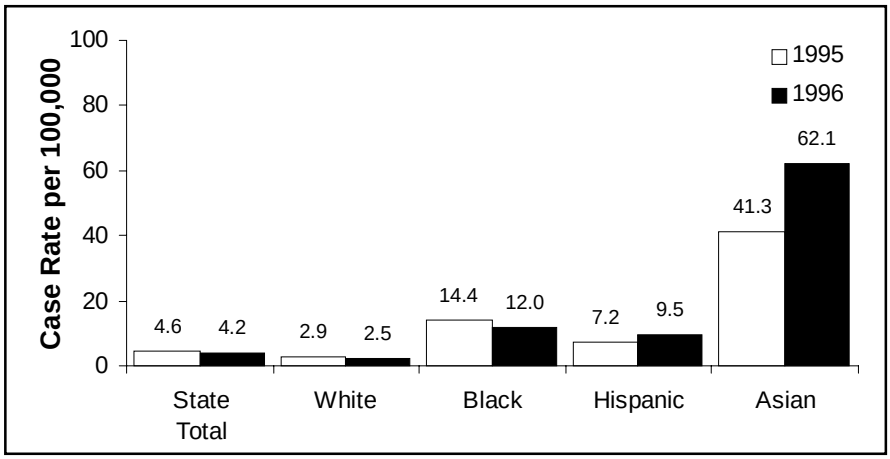

Figure 4. Tuberculosis case rates per 100,000 population by race and ethnicity, Missouri, 1995 and 1996.

Tuberculosis case rates vary significantly among racial and ethnic groups. In 1996, non-Hispanic whites accounted for 116 cases (51.8%), non-Hispanic blacks 70 (31.3%), Asians 30 (13.4%) and Hispanics 8 (3.6%). Asians had the highest case rate in 1996 at 62.1 compared to blacks at 12.0, Hispanics at 9.5 and whites with the lowest case rate of 2.5. From 1995 to 1996, rates increased among Asians and Hispanics. However, declining rates were noted among blacks and whites. See Figure 4.

The largest proportion of active disease cases were pulmonary with 182 (81.3%) as compared with 42 extrapulmonary (18.8%). There were 9 cases with dual disease sites. The types of extrapulmonary disease were lymphatic (12), pleural (9), bone (8), genitourinary (3), meningeal (2), miliary (1) and other (7). See Figure 5.

In 1996, drug susceptibility studies were performed on 186 (83.0%) of the 224 new tuberculosis cases reported. Three multiple drug resistant cases were reported during 1996. In addition, the single drug resistance rate remained high at 8.5 percent. When the rate exceeds four percent, initial use of four tuberculosis drugs is recommended for all suspects and active disease patients.

A pilot computerized data-matching project was initiated in June 1996 to determine dual diagnoses of tuberculosis and HIV/AIDS. Tuberculosis cases reported from January 1993 through December 1995 were matched to the entire set of HIV/AIDS cases reported in the HIV/AIDS Reporting System (HARS) database. As a result of this project, the STD/HIV and tuberculosis control bureaus now have a more efficient tool to collect information regarding dual diagnoses and completeness of reporting. Forty-nine cases were identified with dual diagnoses. Of the 49 cases, 37 were previously reported with tuberculosis in the HARS database and therefore the

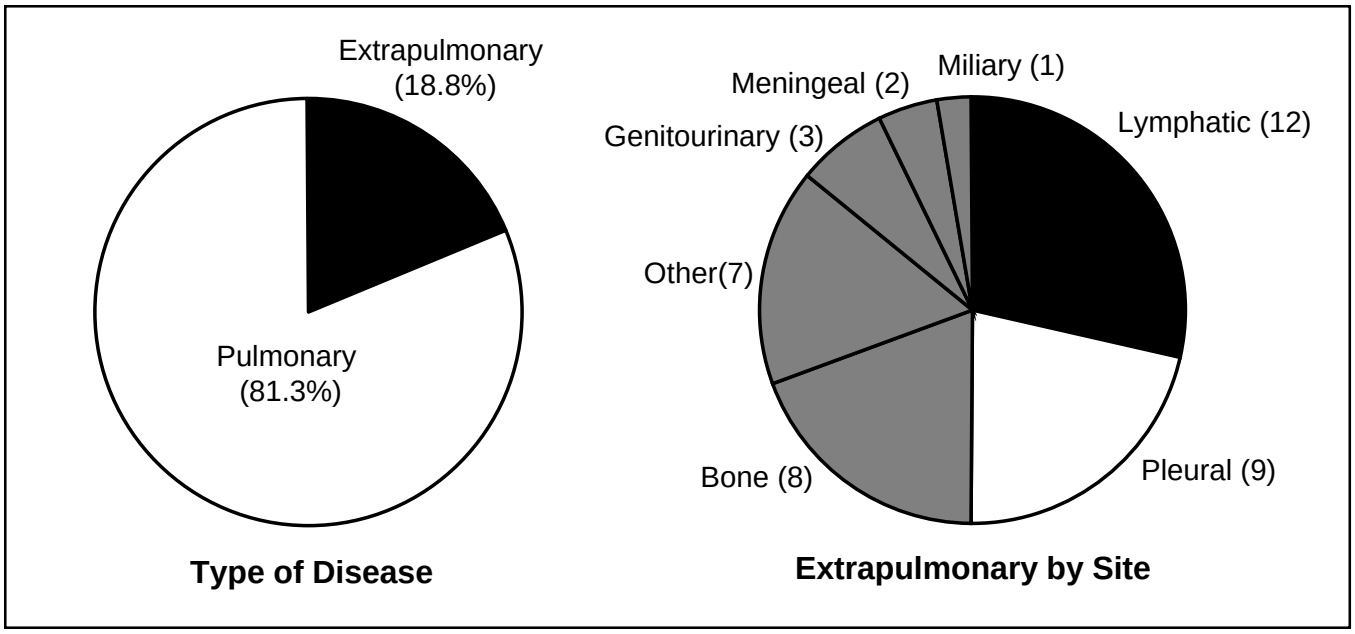

Figure 5. Reported tuberculosis cases by type of disease and site, Missouri, 1996.

completeness of reporting rate was 75 percent. Forty-one (84%) of the 49 cases were between the ages of 25–44. The remaining eight (16%) cases were age 45 or older. For the future, the computerized matching of databases will continue on a quarterly basis.

In 1996, only one active disease case was reported in the state correctional system as compared to three cases in 1995. The tuberculosis case rate in 1996 among state correctional inmates was 4.7 per 100,000 population. This is half the national rate of 8.0 and close to the state rate of 4.2. During 1996, a total of 24,560 inmates were screened. Of those, 555 (2.3%) were identified as new positives and 3,378 (13.8) had a history of previously positive skin tests. In 1996, a total of 7,736 employees in the state correctional system were tested. Of those tested, 73 (0.9%) were identified as new positives and 814 (10.5%) had a history of previously positive skin tests.

The number of tuberculosis cases reported in nursing homes and long-term care facilities is of concern to the Bureau of Tuberculosis Control. These facilities accounted for 13 (5.8%) of the reported cases in 1996. The bureau is addressing this issue by working closely with nursing home associations, residential care associations and the Division of Aging to provide facilities with the recommendations for tuberculin testing and follow-up of residents and employees.

The number of tuberculosis cases occurring among foreign-born persons increased from 27 (11%) in 1995 to 40 (18%) in 1996. However, case rates among foreign-born Asians are disproportionately higher than for other racial and ethnic groups. Asians accounted for 30 (13.4%) of all reported cases with a case rate of 62.1 per 100,000 population in 1996. This is substantially higher than the Asian case rate of 41.3 per 100,000 in 1995.

Directly observed therapy (DOT) has been adopted as the standard of care in Missouri. Our emphasis is on putting all active disease patients on DOT to ensure that therapy is completed. This strategy involves watching people swallow their pills. Our first priority is to motivate people to come to the local health departments for DOT. However, if this does not occur, then we must go to them. Volunteers will be recruited to assist the local health departments in conducting DOT and directly observed preventive therapy (DOPT). In 1995, 58.4 percent of the active disease patients were on DOT and this improved to 74.1 percent in 1996. However, much work remains to be done to reach 100 percent.

The initial use of four tuberculosis drugs is another priority for this program, in order to lower the single drug resistance rate. All suspects and active disease patients should be started on four drugs from the beginning of treatment until drug susceptibility is determined. Those drugs include isoniazid, rifampin, pyrazinamide and ethambutol or streptomycin. In 1995, only 50 percent of active disease patients were placed on the four-drug regimen. In 1996, this improved somewhat to 65 percent. However, much work remains in order to reach 100 percent.

If the downward trend in tuberculosis morbidity continues over the next few years, Missouri will attain its interim goal of no more than 175 new tuberculosis cases by the year 2000 and will be well on its way to the goal of tuberculosis elimination by the year 2010.

Sexually Transmitted Diseases and HIV - 1996

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1996 Highlights

- ✔ 62% decrease in P&S Syphilis
- ✔ 74% decrease in Congenital Syphilis
- ✔ 25.5% decrease in Gonorrhea
- ✔ Institute of Medicine Report
- ✔ Reductions in AIDS Deaths

1996 was a tremendous year for the reduction of sexually transmitted disease. Missouri continued to effect reductions in gonorrhea and syphilis through strong prevention efforts in partnership with local health departments, clinicians, and community-based organizations that provide health education/risk reduction services to epidemiologically targeted populations. There was a national decline in AIDS deaths due in part to prevention efforts and to patient success with combination therapies. New sampling technologies for HIV such as oral sampling, home collection and rapid testing have entered the public health arena and can be utilized in innovative ways to increase individual awareness of serostatus. However, concomitant with these successes were continued increases in HIV and chlamydial infections. Missouri youth are at an ever increasing risk for sexually transmitted disease, and minority populations are disproportionately impacted by HIV and other sexually transmitted infections. Continued targeted and aggressive public health activity is necessary to halt sexually transmitted disease epidemics so that Missourians will achieve our fullest health potential in the face of emerging pathogens.

Early Syphilis: Primary and Secondary (P&S) and Early Latent (less than one year's duration)

During 1996, a total of 480 early syphilis cases were reported in Missouri residents. This represents a 56 percent decline from the 1,090 cases reported in 1995. Of the 480 reported cases of early syphilis, 46 percent (221 cases) were in the primary or secondary stage and 53.9 percent (259 cases) were in the early latent stage. These figures represent a 62.2 percent decline in P&S syphilis cases, and a 48.8 percent decline in early latent syphilis cases, from the 584 P&S cases and the 506 early latent cases reported in 1995. See Figure 1 for the P&S trends.

Notable declines in the number of P&S syphilis cases reported were seen in all areas of the state. St. Louis City reported 278 cases of early syphilis in 1996 (57.9% of Missouri cases), for a rate of 35.8 per 100,000 population. This is a 57.2 percent decrease from the 650 cases reported from St. Louis in 1995. St. Louis County reported 123 early syphilis cases in 1996 (25.6% of the state total), which represents a 58.9 percent decrease from the 299 cases reported in 1995. Kansas City reported 20 cases of early syphilis in 1996 (4.2% of Missouri cases), a 62.2 percent decrease from the 53 cases reported in 1995. Outstate Missouri

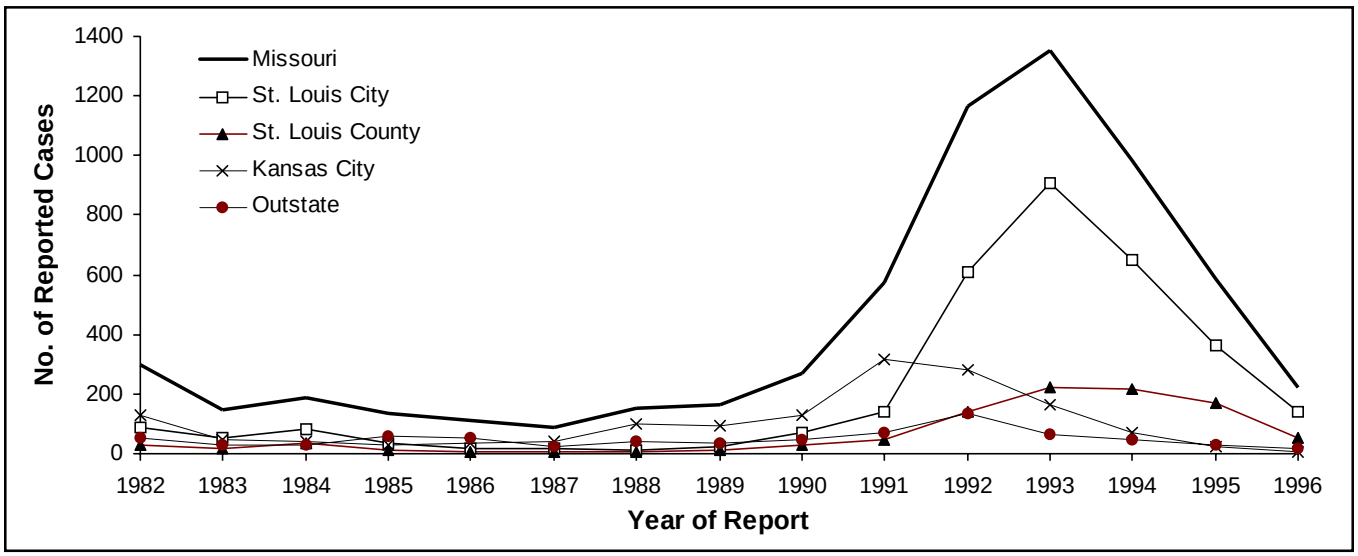

Figure 1. Reported primary and secondary syphilis cases by geographic area and year of report, Missouri, 1982–96.

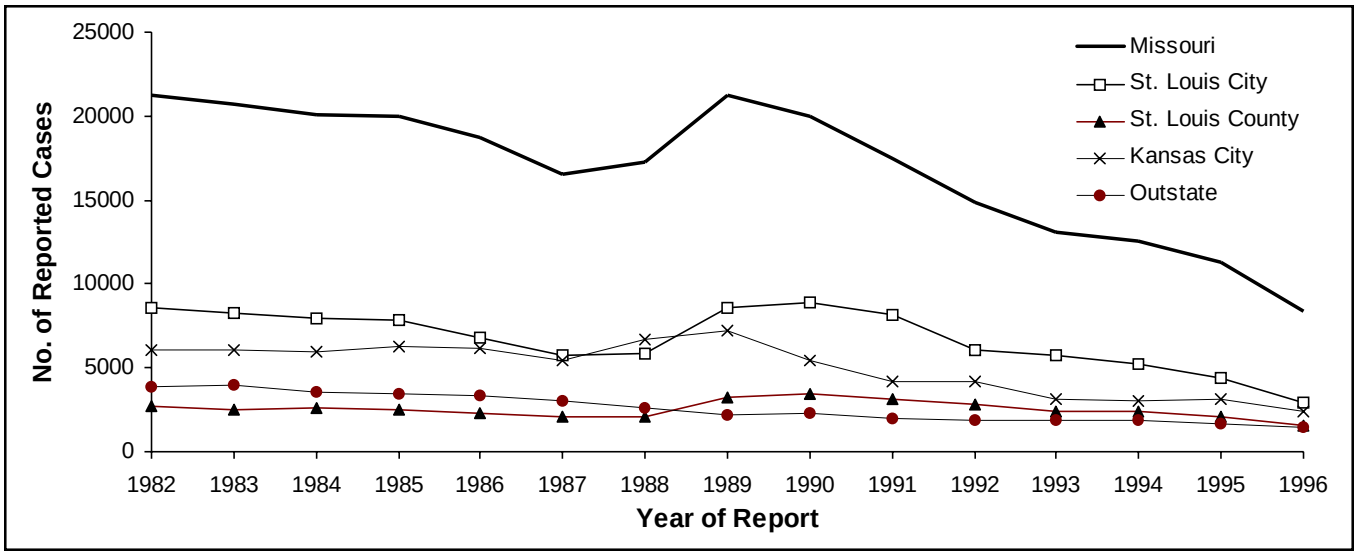

Figure 2. Reported gonorrhea cases by geographic area and year of report, Missouri, 1982–96.

reported 59 early syphilis cases in 1996 (12.3% of the state's total), a 44.3 percent decrease from the 88 cases reported in 1995.

During 1995,* 584 cases of P&S syphilis were reported in Missouri, which was 3.5 percent of the 16,500 cases nationwide. The rate of P&S syphilis cases in Missouri in 1995 was 11.4 per 100,000 population. This rate was 1.8 times greater than the United States rate of 6.3 per 100,000 population.

Although a significant decline in reported cases of early syphilis occurred during 1996, certain populations continue to be disproportionately represented among reported cases. African Americans comprise 92.3 percent of all reported P&S syphilis cases, whereas whites accounted for only 5.9 percent. The disproportionate impact of sexually transmitted diseases among African American and Latino Missourians remains a concern. The Department of Health is working actively with the Missouri HIV/STD Prevention Community Planning Group and regional groups to target prevention messages and interventions to the African American and Latino populations. Exchange of sex for drugs (primarily crack cocaine) or money, and low socioeconomic status, continue to be factors influencing disease incidence. Intensified public health field work and community outreach efforts are strongly contributing to declining early syphilis morbidity, as evidenced by the fact that, since 1992, Missouri has seen an 81.1 percent decrease in reported cases.

* 1995 is the most recent year for which U.S. data are available.

Congenital Syphilis

Reported cases of congenital syphilis continue to decrease. A total of 12 cases were reported in Missouri during 1996, representing a 73.9 percent decline from the 46 cases reported in 1995. St. Louis City reported the largest number of congenital syphilis cases (7, or 58.3% of total Missouri cases), followed by St. Louis County (4 cases 33.3% of the state total). A single case was reported from Outstate Missouri (8.3% of total reported cases). African American infants are disproportionately represented among congenital syphilis cases, comprising 10 (83.3%) of the 12 cases reported in 1996.

The continuing decline in reported congenital syphilis cases since 1993 can be attributed to successful intervention efforts in higher incidence areas which include routine screening of pregnant women, as well as enhanced prevention efforts with their male partners. These components are crucial to maintaining the number of congenital syphilis cases at a low level.

Gonorrhea

In 1996, reported cases of gonorrhea in Missouri decreased by 25.5 percent, from 11,299 cases in 1995 to 8,414 cases in 1996. This represents the eighth consecutive year that reported cases have declined statewide. St. Louis City reported 34.3 percent (2,884 cases) of all Missouri gonorrhea cases; Kansas City 28.5 percent (2,400 cases); St. Louis County 19.2 percent (1,614 cases), and Outstate Missouri 18.0 percent (1,516 cases). Each of these regions showed decreases in reported cases from 1995 to 1996: St. Louis City, -34.7 percent; Kansas City, -24.4 percent; St. Louis County, -21.7 percent; and Outstate Missouri, -8.0 percent. See Figure 2.

Two population groups are disproportionately represented among reported gonorrhea cases: African Americans and youth. African Americans made up 6,242 (74.4%) of the 8,414 reported cases in Missouri in 1996; the corresponding rate was 1,142 per 100,000 population. Whites contributed 850 (10.1%) reported cases, for a rate of 18.9 per 100,000 population. Youth between the ages of 13-19 made up 34.7 percent of total reported gonorrhea cases in 1996.

Missouri's declining numbers of reported gonorrhea cases parallel an overall

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national trend that has been occurring in recent years. However, during this time Missouri's gonorrhea rate has been consistently higher than the national average. In 1995, the rate of gonorrhea cases per 100,000 population in Missouri (220.8) was 2.5 times the national rate (149.5).

Eighteen penicillinase-producing *Neisseria gonorrhoeae* (PPNG) cases were reported in Missouri during 1996.*

Chlamydia

Reported cases of *Chlamydia trachomatis* infections in Missouri decreased 1.0 percent from 12,052 cases in 1995 to 11,935 cases in 1996. Small declines were seen in all areas of the state except Kansas City, where there was a 58.8 percent increase in reported cases from 1995 to 1996 due to a reporting anomaly from a major reporting site. The anomaly accounted for approximately 1,000 cases which should have been included in the 1995 morbidity totals.

An increase in reported cases of chlamydia infection is expected in 1997 due to focused efforts of the Missouri Infertility Prevention Project (MIPP) to screen high risk women of childbearing age for both chlamydia infection and gonorrhea. Infertility prevention programs were implemented in several states and territories as a result of a pilot program initiated in 1988 in the Pacific Northwest (U.S. Public Health Service Region X) for large-scale screening for *C. trachomatis*, involving interdisciplinary cooperation and low-cost testing in centralized laboratories. The program raised the level of cooperation and collaboration between STD and family planning programs. As a result of the screening, subsequent effective treatment and other factors, the prevalence of chlamydia infections among women receiving reproductive health care services at family planning clinics was reduced by 58 percent.** In 1996, the MIPP screened 108,205 individuals for *C. trachomatis* infection, and reported an overall positivity rate of 4.5 percent, down 0.2 percent from the rate of 4.7 percent in 1995.

Youth, and particularly females between the ages of 13 and 24, are disproportionately represented among reported cases of chlamydia infection. Of total cases reported in 1996, 88.5 percent were in females, and of these females, over 75 percent were less than 25 years of age. See Figure 3. The disproportionate representation of females reflects their selective screening through the MIPP. If similar widespread screening of males were also undertaken, it is expected that the number of diagnosed and reported cases in males would be much higher than is currently seen.

Youth At Risk

In the United States this year, 12 million persons will be infected with a sexually transmitted disease. Three million of these persons will be teenagers.*** Missouri youth are clearly at risk for acquiring HIV infection, chlamydia infection, gonorrhea, and other sexually transmitted diseases. In Missouri during 1996, AIDS was the third leading cause of death in males 25–34 years of age, and the second leading cause of death in African American males in this age group. Among African American females 25–34 years of age, AIDS was the fifth leading cause of death. Many persons diagnosed with severe HIV disease (AIDS) while in their twenties may have been infected as teenagers. The highest risk group for chlamydia infections in Missouri is 14–19 year old females, reflecting a trend that is seen nationwide.

*Specific follow-up to differentiate PPNG from other strains of gonorrhea is not actively pursued because adequate treatment of PPNG is achieved by the current recommended treatment regimen.

** National Coalition of STD Directors, *Proposed Equitable Adjustments to the Current Distribution of Regional Infertility Prevention Project Funding to the STD Project Areas*, 1997.

*** Institute of Medicine, *The Hidden Epidemic: Confronting Sexually Transmitted Diseases*, (Washington, D.C.: National Academy Press, 1997).

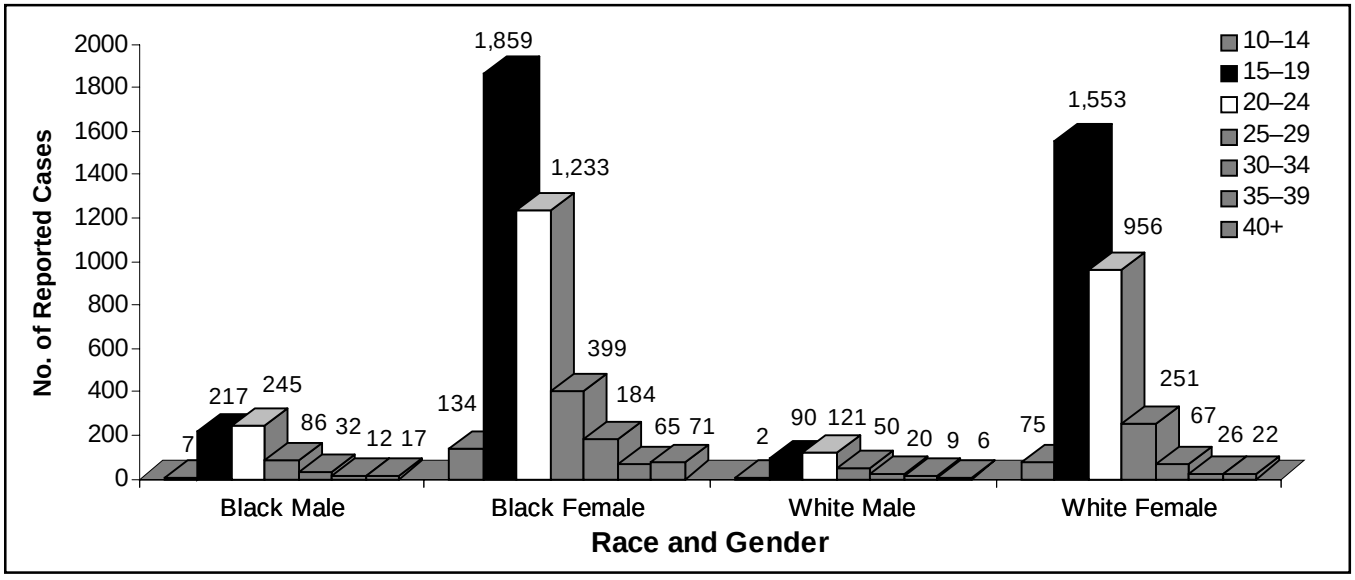

Figure 3. Reported chlamydia cases by race and gender, Missouri, 1996.

In a 1995¶ survey of 26 rural and urban Missouri school districts conducted by the Missouri Department of Elementary and Secondary Education, 9–12th graders indicated the following:

- 54% of high school students have had sexual intercourse
- 12% of 9th graders reported being sexually active before age 13
- 15% of 9th graders reported having sex with four or more partners, compared with 27% of 12th graders
- 60% of 9th graders reported using a condom during the last sexual intercourse, compared with 48% of 12th graders.

¶1995 is the most recent year for which data are available.

In February 1997, a National Institutes of Health Consensus Panel* strongly endorsed the use of behavioral intervention programs including syringe exchange, drug abuse treatment and youth education on safer sex as necessary actions to reduce the infection and transmission of HIV. The panel based its recommendations on scientific evidence which appeared to clearly demonstrate the effectiveness of such interventions.**

HIV Disease

Through the end of 1996, a total of 10,722 cases of HIV disease had been reported in Missouri residents; 4,228 (39.4%) of these individuals are known to have died. During 1996, 1,381 cases of HIV disease were reported.

HIV disease can be categorized as either 1) HIV cases or 2) severe HIV disease. Persons with **severe HIV disease** are those who have met the Centers for Disease Control and Prevention (CDC) surveillance case definition for AIDS (as the result of a CD4+ lymphocyte count <200/µL or the occurrence of a specific opportunistic disease), reflecting the presence of significant immune system damage and the fact that they are in a later stage of the disease process. For the purposes of this report, the term **severe HIV disease** is synonymous with AIDS. **HIV cases** refer to persons with HIV infection whose disease is at an earlier stage and who have not developed severe immune system damage. Thus, HIV cases in general represent persons more recently infected with HIV in comparison to cases of severe HIV disease.

Of the 10,722 reported HIV disease cases, 7,181 had severe HIV disease, and 3,541 were HIV cases. During 1996, 845 cases of severe HIV disease and 536 HIV cases were reported. For severe HIV disease cases reported in Missouri residents during 1996, the rate was 16.5 cases per 100,000 population; in comparison, the United States severe HIV disease (AIDS) rate in 1996 was 25.2.

After an apparent plateau period in the early 1990s, the number of annually reported cases of severe HIV disease in Missouri has increased during the past two years. See Figure 4. The 845 cases of severe HIV disease reported during 1996 represented a 9.9 percent increase over the 769 cases reported in 1995. Early diagnosis of HIV infection and aggressive treatment with recommended combination therapies may, over time, contribute to decreases in the annual numbers of reported cases of severe HIV disease.

It is estimated that there are currently 8,000–11,000 persons with HIV living in Missouri. Included here are reported HIV disease cases, as well as individuals who have not yet been diagnosed and reported to public health officials. A notable development in 1996 was that the St. Louis metropolitan area, with a severe HIV disease rate of 18.8 per 100,000 population, became one of the top 50 large metropolitan areas having the highest annual rates of reported severe HIV disease cases. See Table 1 on page 26.

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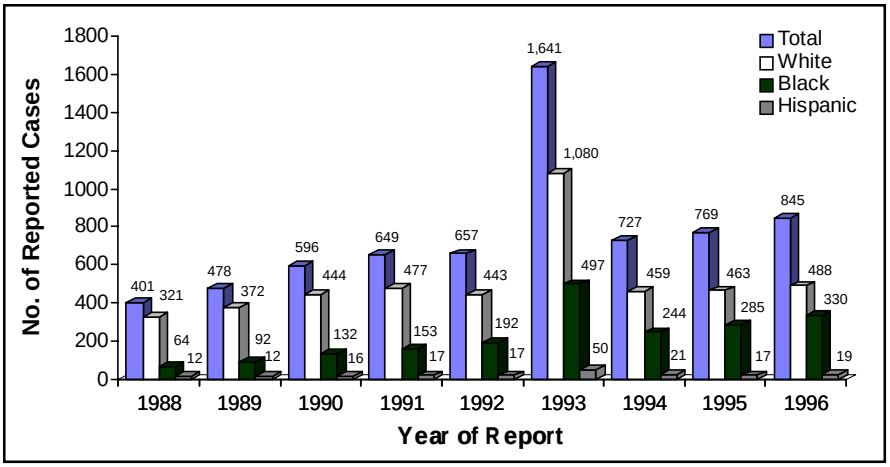

Figure 4. Reported severe HIV disease (AIDS) cases by race/ethnicity and year of report, Missouri, 1982–96.

*The NIH Consensus Development Program was established in 1977 as a mechanism to resolve in an unbiased, impartial manner, controversial issues in medicine and public health.

** Syringe exchange refers to interventions where sterile needles are provided to drug users in exchange for used needles. The purpose of syringe exchange is to prevent reuse of needles and facilitate interaction with public health services, with the goal of preventing infection and transmission of HIV and assisting drug users in gaining access to drug treatment.

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HIV Disease by Gender

The substantial majority of HIV disease cases continue to be reported in males. Of the 7,181 cumulative cases of severe HIV disease which have been reported through 1996, 6,642 (92.5%) were males. However, females have slowly but progressively been making up a larger proportion of annually reported cases, and in 1996 comprised 11.6 percent of cases reported. Females also appear to be making up a higher proportion of more recently infected persons, as indicated by the fact that females represent 14.3 percent of cumulative HIV cases, but only 7.5 percent of cumulative severe HIV disease cases.

HIV Disease by Race and Ethnicity

Whites make up a majority of reported HIV disease cases (68.1% of cumulative cases of severe HIV disease, and 51.9 percent of cumulative HIV cases, with white males contributing 64.4 percent of all severe HIV disease cases and 46.2 percent of all HIV cases). However, African Americans, along with Latino males, are overrepresented in the epidemic. The rate per 100,000 population for both severe HIV disease and HIV cases is much higher in African Americans than in whites, with Latinos having intermediate rates. For severe HIV disease cases reported in 1996, the rate in whites was 11.0 per 100,000; in African Americans, 60.5 per 100,000; and in Latinos, 30.8 per 100,000. However, the total number of reported severe HIV disease cases in Hispanics, 189, is much lower than the 4,888 cases reported in whites and the 2,054 cases reported in African Americans. Of the 189 reported Hispanic cases, 183 (96.8%) are in males.

The annual number of reported severe HIV disease cases has, in general, continued to increase for both whites and African Americans since the beginning of the epidemic. However, during the past eight years, the rate of increase in annually reported cases has been noticeably higher for African Americans compared to whites. From 1995 to 1996, the annual number of reported cases of severe HIV disease in African Americans increased by 15.8 percent (from 285 to 330 cases), whereas the increase among whites was 5.4 percent (from 463 to 488 cases). See Figure 4.

Table 1. Metropolitan Areas* With the 50 Highest AIDS Annual Rates per 100,000 Population—United States, January–December 1996.

Metropolitan Area of Residence	Rate	Metropolitan Area of Residence	Rate
New York, NY	120.1	Las Vegas, NV	28.9
Miami, FL	99.4	Oakland, CA	28.5
Jersey City, NJ	97.7	Norfolk, VA	28.2
San Francisco, CA	95.0	Memphis, TN	27.3
West Palm Beach, FL	85.4	Austin, TX	26.9
Fort Lauderdale, FL	83.6	Rochester, NY	26.5
Newark, NJ	73.9	Middlesex, NJ	26.1
San Juan, Puerto Rico	70.4	Seattle, WA	26.1
Baltimore, MD	61.6	San Antonio, TX	25.7
Baton Rouge, LA	58.5	Richmond, VA	25.6
New Orleans, LA	58.2	Nassau-Suffolk, NY	24.3
Washington, D.C.	47.3	Nashville, TN	24.1
Atlanta, GA	46.4	Chicago, IL	23.8
Houston, TX	45.3	Louisville, KY	23.4
Wilmington, DE	43.4	Birmingham, AL	22.7
Los Angeles, CA	40.7	Monmouth-Ocean, NJ	22.7
New Haven, CT	37.3	Riverside-San Bernardino, CA	21.7
Orlando, FL	37.2	Denver, CO	20.9
San Diego, CA	37.1	Sarasota, FL	20.8
Jacksonville, FL	36.5	Albany-Schenectady, NY	20.7
Bergen-Passaic, NJ	36.1	Tucson, AZ	20.4
Tampa-St. Petersburg, FL	36.1	Boston, MA	19.0
Hartford, CT	34.1	**St. Louis, MO**	**18.8**
Philadelphia, PA	33.9	Portland, OR	18.5
Springfield, MA	33.5	Providence, RI	18.5
Dallas, TX	29.3		

*Includes only metropolitan areas with a population ≥500,000. Metropolitan areas are named for a central city or county, may include several cities and counties, and may cross state boundaries.

HIV Disease by Age Group

Among cumulative reported cases of severe HIV disease, the largest percentage (45.9%) were diagnosed between the ages of 30–39; the second largest percentage (23.4%) were diagnosed between the ages of 20–29. Among cumulative reported HIV cases, the largest percentage (41.3%) were diagnosed between the ages of 20–29; the second largest percentage (37.5%) were diagnosed between the ages of 30–39.

Of total reported HIV cases, 4.7 percent (167 cases) were diagnosed in teenagers; this includes 16.3 percent of all HIV cases reported from African American females, 10.3 percent from white females, 4.7 percent from African American males and 2.2 percent from white males. In addition, some HIV disease cases who were first diagnosed in their twenties were likely to have been initially infected while in their teens.

HIV Disease by Exposure Category

Men who have sex with men (MSM) continue to comprise the largest numbers of reported HIV disease cases; in 1996, 62.0 percent of reported cases of severe HIV disease, and 54.3 percent of reported HIV cases, were in MSM. See Table 2. However, among persons more recently infected with HIV, a smaller proportion appear to have been infected through male homosexual contact. In addition, reported cases of severe HIV disease in MSM have shown evidence of plateauing in recent years, although this has not been seen in cases from African

Table 2. Reported HIV Disease by Exposure Category, 1982–1996

	HIV Cases*				Severe HIV Disease (AIDS) Cases**				Total HIV Disease Cases	
	Reported 1996		Cumulative		Reported 1996		Cumulative		Cumulative	
Exposure Category										
MSM	291	(54.3%)	2,079	(58.7%)	524	(62.0%)	5,068	(70.6%)	7,147	(66.7%)
MSM/IDU	21	(3.9%)	231	(6.5%)	68	(8.0%)	652	(9.1%)	883	(8.2%)
IDU	33	(6.2%)	379	(10.7%)	93	(11.0%)	629	(8.8%)	1,008	(9.4%)
Heterosexual Contact	79	(14.7%)	466	(13.2%)	88	(10.4%)	449	(6.3%)	915	(8.5%)
Adult Hemophiliac	2	(0.4%)	26	(0.7%)	5	(0.6%)	138	(1.9%)	164	(1.5%)
Adult Transfusion	2	(0.4%)	15	(0.4%)	7	(0.8%)	96	(1.3%)	111	(1.0%)
Other/Unknown Adult	104	(19.4%)	307	(8.7%)	56	(6.6%)	92	(1.3%)	399	(3.7%)
Perinatal Transmission	4	(0.7%)	31	(0.9%)	3	(0.4%)	38	(0.5%)	69	(0.6%)
Other/Unknown Pediatric	0	(0.0%)	7	(0.2%)	1	(0.1%)	19	(0.3%)	26	(0.2%)
Missouri Total	**536**	**(100.0%)**	**3,541**	**(100.0%)**	**845**	**(100.0%)**	**7,181**	**(100.0%)**	**10,722**	**(100.0%)**

*HIV Cases-Persons with HIV infection who have not developed one of the specific diseases or conditions which would cause them to meet the case definition for AIDS.
**AIDS Cases-Persons with HIV infection who have developed one or more of the specific diseases or conditions which cause them to meet the AIDS case definition.

American MSM, where the annual number of reported cases has continued to increase. In 1996, African American men made up 34.0 percent of severe HIV disease cases reported in MSM.

Men who have sex with men and inject drugs (MSM/IDU) comprised 8.1 percent of severe HIV disease cases, and 3.9 percent of HIV cases, reported in 1996. No clear upward or downward trends have been apparent among reported cases of severe HIV disease in MSM/IDU in recent years. During the past five years, the proportion of annually reported MSM/IDU cases of severe HIV disease contributed by African American men has remained generally constant in the range of 30–37 percent.

Injecting drug users (IDUs) comprised 11.1 percent of severe HIV disease cases, and 6.2 percent of HIV cases, reported in 1996. The annual number of reported cases of severe HIV disease in IDUs has generally continued to increase; the 93 cases reported in 1996 represented a 22.4 percent increase over the 76 cases reported in 1995. This general upward trend has occurred in both African Americans and whites. African Americans make up 50.2 percent of total reported cases of severe HIV disease in IDUs.

Heterosexual contacts comprised 10.5 percent of severe HIV disease cases, and 14.8 percent of HIV cases, reported in 1996. The annual number of reported cases of severe HIV disease in heterosexual contacts has continued to increase; the 88 cases reported in 1996 represented a 14.3 percent increase over the 77 cases reported in 1995. This upward trend in reported cases has, in general, occurred in both African Americans and whites (although in 1996, eight fewer white cases were reported than in 1995). For two of the past three years, African Americans have made up over 60 percent

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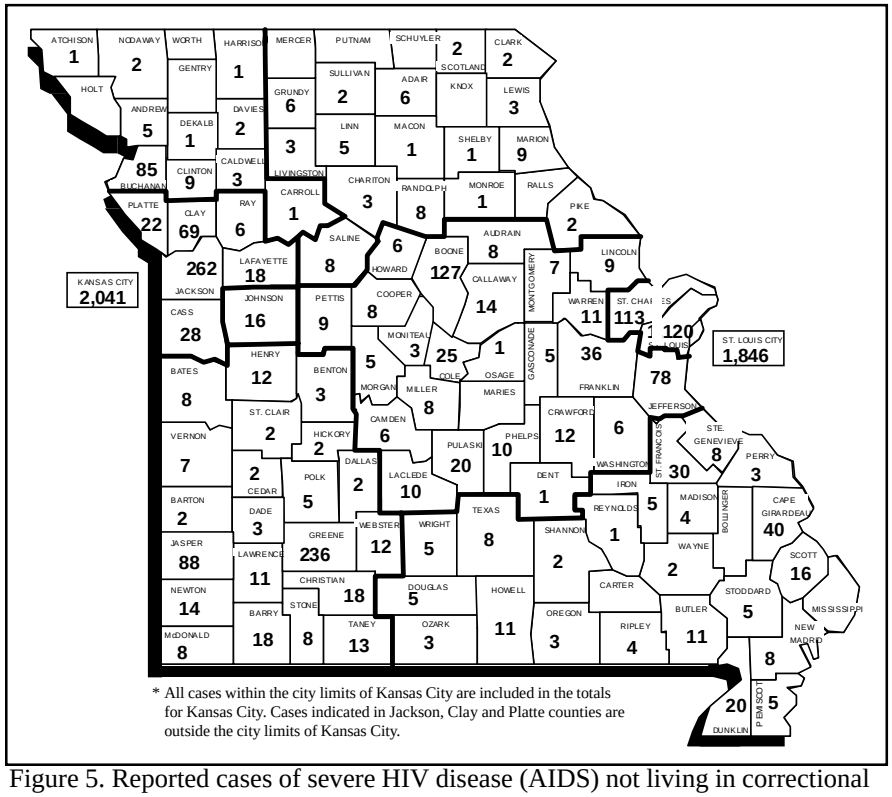

Figure 5. Reported cases of severe HIV disease (AIDS) not living in correctional facilities at time of diagnosis by county, Missouri, cumulative through 1996.

(continued from page 27)
of reported cases of severe HIV disease in heterosexual contacts (63.6% of cases reported in 1996). In addition, African Americans appear to be making up a larger proportion of more recently infected persons who acquired their HIV infection through heterosexual contact.

A total of 38 perinatal cases* of severe HIV disease and 31 perinatal HIV cases have been reported, including three severe HIV disease cases and four HIV cases reported in 1996. Almost all recent infections in children have been the result of perinatal transmission.

HIV Disease by Geographic Area

Missouri has been divided into seven geographic regions for purposes of HIV prevention community planning. These regions are outlined in Figure 5, which also shows the total number of reported severe HIV disease cases by county. Of the 7,181 total severe HIV disease cases reported, 3,079 (42.9%) were from the three-county St. Louis Planning Region (SLPR), and 2,446 (34.1%) were from the six-county Kansas City Planning Region (KCPR). These two regions have also had the highest rates of severe HIV disease (26.8 and 21.3 per 100,000 population, respectively in 1996). The geographic location (by zip code area) of cumulative HIV cases and severe HIV disease cases in St. Louis City and County are shown in Figures 6 and 7. For more information on HIV disease in specific zip codes for the St. Louis region, please contact the Metropolitan St. Louis AIDS Program at (314) 658-1159.

HIV Disease: Treatment and Prevention

Increasingly effective treatments for HIV disease have become available in recent months, and appear to significantly increase the survival rates of many HIV-infected persons. Treatment of HIV disease is now based on combination therapy with antiretroviral drugs. As more is learned about HIV and the mechanisms

(continued on page 29)

* Perinatal cases are the result of HIV transmission from an HIV infected mother to her infant before or at the time of birth.

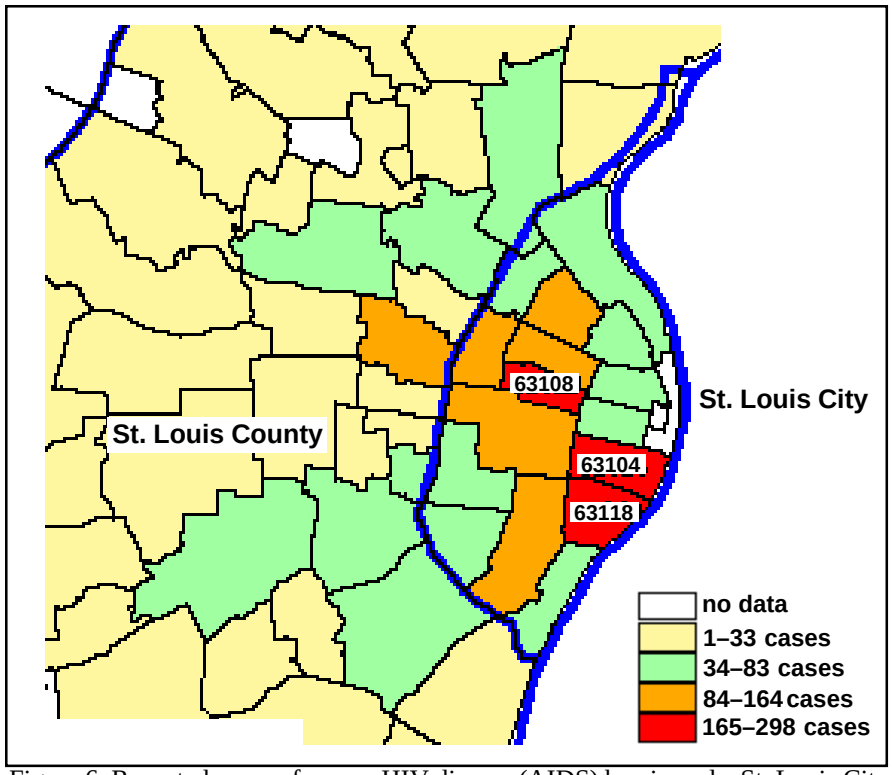

Figure 6. Reported cases of severe HIV disease (AIDS) by zip code, St. Louis City and County, cumulative through 1996.

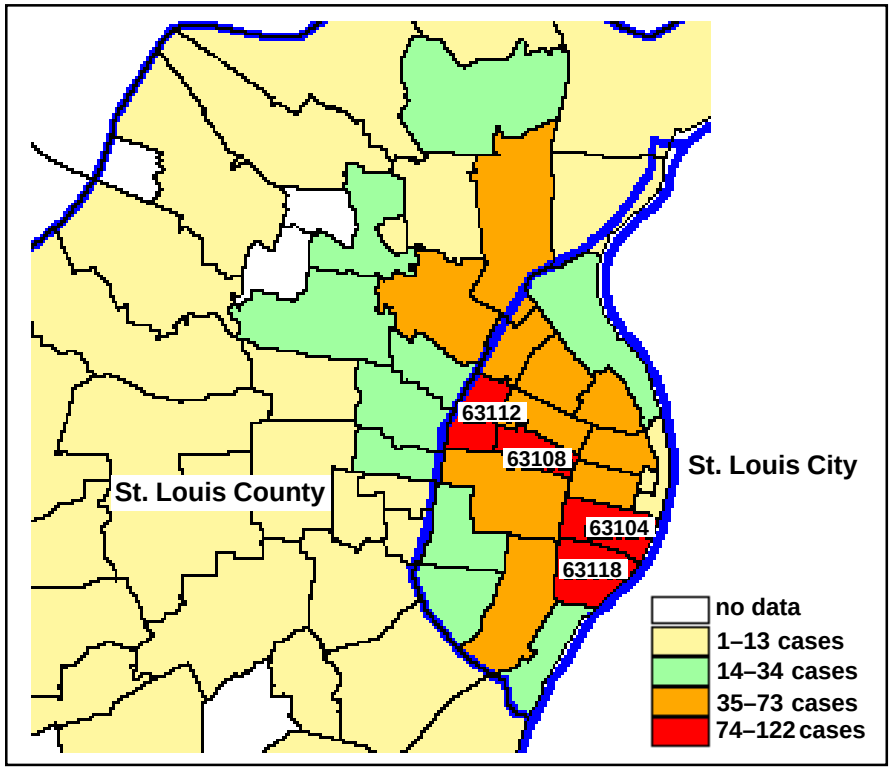

Figure 7. Reported HIV cases by zip code, St. Louis City and County, cumulative through 1996.

Bureau of Communicable Disease Control 1996 Annual Report

(continued from page 7)
meningitis have steadily decreased since 1993. Active surveillance for Hib disease was done in 1992 and 1993 as part of the Invasive Bacterial Disease Project. Evidence from this project suggests that reporting of invasive Hib disease other than meningitis in Missouri is incomplete.

REFERENCE:

1. CDC. E coli O157:H7–what the clinical microbiologist should know. March 1994.

Table 1. Most common *Salmonella* serotypes, Missouri, 1996 and 1995

	1996			1995		
	Serotype	No. of Cases	Percent	Serotype	No. of Cases	Percent
1.	*S. typhimurium*	134	23.7%	*S. typhimurium*	129	22.4%
2.	*S. enteritidis*	64	11.3%	*S. enteritidis*	83	14.4%
3.	*S. braenderup*	46	8.1%	*S. newport*	38	6.6%
4.	*S. newport*	36	6.4%	*S. javiana*	32	5.5%
5.	*S. heidelberg*	23	4.1%	*S. heidelberg*	28	4.9%
6.	*S. javiana*	12	2.1%	*S. muenchen*	13	2.3%
7.	*S. infantis*	11	1.9%	*S. poona*	13	2.3%
8.	*S. oranienburg*	10	1.8%	*S. bareilly*	11	1.9%
9.	*S. poona*	10	1.8%	*S. saint paul*	9	1.6%
10.	*S. agona*	8	1.4%	*S. braenderup*	8	1.4%
11.	*S. thompson*	8	1.4%	*S. oranienburg*	8	1.4%
				S. hadar	8	1.4%
	All Others	203	36.0%	All Others	197	34.1%
	Total	**565**	**100.0%**	**Total**	**577**	**100.0%**

STDs and HIV—1996

(continued from page 28)
by which it causes disease, and as additional drugs become available, there is reason to hope that the treatment of HIV disease will become even more effective. However, two key points need to be emphasized. First, treatment recommendations for HIV infection are highly complex and continually changing. Because of this complexity, all HIV-infected persons should be under the care of a medical provider who has expertise in treating this condition, or who is treating the individual in consultation with another provider who has such expertise. Second, these therapeutic advances, although highly encouraging, do not represent a cure, and do not work for all HIV-infected persons. Consequently, there must be continued emphasis on prevention of new infections.

Communities throughout Missouri continue to offer HIV testing to populations of greatest epidemiologic risk through community outreach venues. Clinicians are encouraged to perform a risk assessment for HIV infection and other sexually transmitted diseases (STDs) on all patients. In addition, clinicians are strongly urged to offer counseling to their patients regarding behavioral risks for HIV infection, and to offer HIV testing. Clinicians caring for pregnant women should universally offer HIV counseling and voluntary testing to these patients. If a pregnant woman is found to be infected with HIV, she should be offered appropriate treatment to reduce the risk of perinatal transmission. The Department of Health's Policy to Reduce the Risk of Perinatal HIV Transmission in Missouri was printed in the March/April 1996 issue of the *Missouri Epidemiologist*.

For more information about STDs, including HIV disease, in Missouri, please call toll free 1 (800) 359-6259. The home page for the Centers for Disease Control and Prevention's Center for HIV, STD and TB Prevention is at http://www.cdc.gov/nchstp/od/nchstp.html. In addition, two free sources of information for medical providers caring for HIV-infected persons are the HIV Telephone Consultation Service from San Francisco General Hospital (1-800-933-3413) and the Public Health Service's HIV/AIDS Treatment Information Service (1-800-HIV-0440).

HIV Treatment Guidelines

New recommendations for the treatment of HIV disease and the prevention of opportunistic infections in HIV-infected persons have been issued:

- Carpenter C, Fischl M, Hammer S, et al: Antiretroviral therapy for HIV infection in 1997: Updated recommendations of the International AIDS Society—USA Panel, JAMA 1997;277:1962–69.
- CDC. 1997 USPHS/IDSA guidelines for the prevention of opportunistic infections in persons infected with human immunodeficiency virus. MMWR 1997;46(No. RR-12). (Available at http://www.cdc.gov/epo/mmwr/mmwr_rr.html.)

In addition, the federal government has recently released two draft documents addressing the treatment of HIV disease: *Report of the NIH Panel to Define Principles of Therapy of HIV Infection* and *Guidelines for the Use of Antiretroviral Agents in HIV-Infected Adults and Adolescents*. Both draft documents are available at http://www.cdcnac.org or http://www.hivatis.org. DHHS is seeking public comment on these two drafts through July 21, 1997. After consideration of the comments, the final documents will be published in the *MMWR*.

Hazardous Substances Emergency Events Surveillance 1996 Annual Report*

Lori J. Harris
Bureau of Environmental Epidemiology

The Hazardous Substances Emergency Events Surveillance (HSEES) system, established by the Agency for Toxic Substances and Disease Registry (ATSDR) in 1990, collects information on the direct public health impact of emergency events involving hazardous substances. Missouri's HSEES program has completed its third year of data collection. As the program continues, new notification sources are explored and information is shared and analyzed to determine the public health impact of emergency events involving the release of hazardous substances in the state of Missouri.

All Missouri HSEES data are transmitted to ATSDR for analysis and comparison along with the data collected from the other 13 participating states. Personal/company identifiers are not transmitted to ATSDR to protect the confidentiality of program participants.

Because the intent of the HSEES program is to reduce the morbidity and mortality related to hazardous substances emergency events, it is important that the public, emergency responders, employees and industries receive feedback information concerning case investigations. In those cases where development of intervention strategies might prevent similar future incidents, specific summary investigation reports are prepared and distributed to the community involved. When appropriate, health education programs to promote prevention strategies are conducted for the affected industry, local emergency planning committees, emergency responders, etc.

This report was supported by funds from the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) trust fund provided to the Missouri Department of Health under Cooperative Agreement Number U61/ATU780955-02 from the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services.

Case Definition for Hazardous Substance Release

A hazardous substance release is entered in the HSEES system if it meets the following criteria:

1. An uncontrolled or illegal release or threatened release of one or more hazardous substances; and
2. The substances that are actually released or threatened to be released include ALL hazardous substances except petroleum products; and
3. The quantity of the hazardous substances which are released, or are threatened to be released, need (or would need) to be removed, cleaned up, or neutralized according to federal, state or local law; or
4. Only a threatened release of hazardous substances exists, but this threat leads to an action such as an evacuation that can potentially impact on the health of employees, responders or the general public. This action makes the event eligible for inclusion into the surveillance system even though the hazardous substances are not released.

Analysis of Data on Hazardous Substances Emergency Events

The Missouri Department of Natural Resources' Environmental Services Program maintains Environmental Emergency Response (EER) reports. All environmental emergencies are to be reported, 24 hours a day, to (573) 634-2436. A total of 1,715 reports were received in 1996 (January 1 through December 31, 1996). Of these, 862 (50%) were petroleum related. There were 200 (12%) potential hazardous substances emergency events. The remaining 653 (38%) incidents involved releases of sewage, solid waste, nonhazardous substances, non-emergency releases, etc. A hazardous substance release is entered into the HSEES system only if it meets the case definition for a hazardous substance release. See sidebar.

In addition, the HSEES program receives fax reports from the United States Coast Guard's National Response Center (NRC) on a daily basis. A total of 91 potential hazardous substances emergencies in Missouri were reported through this source. Of these 91 reports, 23 (25%) met the HSEES case definition and were entered in the HSEES database. Other notification sources include reports from the Missouri Highway Patrol, the Missouri Occupational Fatality Assessment and Control Evaluation Program (MOFACE) and the media.

Of the 298 events received from all sources and investigated by the HSEES Coordinator, 178 were entered into the

HSEES database. Only 161 (90%) of those events met the case definition and were counted in 1996. Fourteen (8%) of the investigations entered were events that occurred in 1995, and three events did not meet the case definition.

The 161 events involved the release of 177 hazardous substances. The majority of events (150/93%) involved the release of only one hazardous substance. The most commonly released substance was ammonia with 34 (21.1%) releases; followed by PCB's and sulfuric acid with 10 (6.2%) releases, each; paint with 7 (4.3%) releases; and ethylene glycol, hydrochloric acid, nitric acid and nitrogen with 6 (3.7%) releases, each.

Events occurred throughout the state, involving 54 counties and St. Louis City. This represents slightly under 50% of the counties of the state. Figure 1 shows the number of events occurring in each county.

One hundred ten (68%) of the events occurred at fixed facilities, while 51 events (32%) were transportation related. Of the 161 events, 140 (87%) occurred on weekdays. Twenty-one events (13%) occurred on the weekend. Slightly over half the events, 92 (57%), occurred between 6 a.m. and 6 p.m., with 67 (42%) occurring between the core working hours of 8 a.m. and 5 p.m., Monday–Friday. Eighteen (11%) occurred between midnight and 6 a.m. and 29 (18%) occurred between 6 p.m. and midnight. Time of event was unknown for 22 (14%) events.

Evacuations were ordered in 12 (7.5%) events. The number of people evacuated was known for eight events and unknown for four events. The eight known events resulted in 1,830 people being evacuated. In any single evacuation, the largest number of known people evacuated was 1,200 and the smallest number was five. Six of the evacuations involved the evacuation of affected building(s) or part of the building, five were downwind evacuations and one was a combination circle/downwind evacuation.

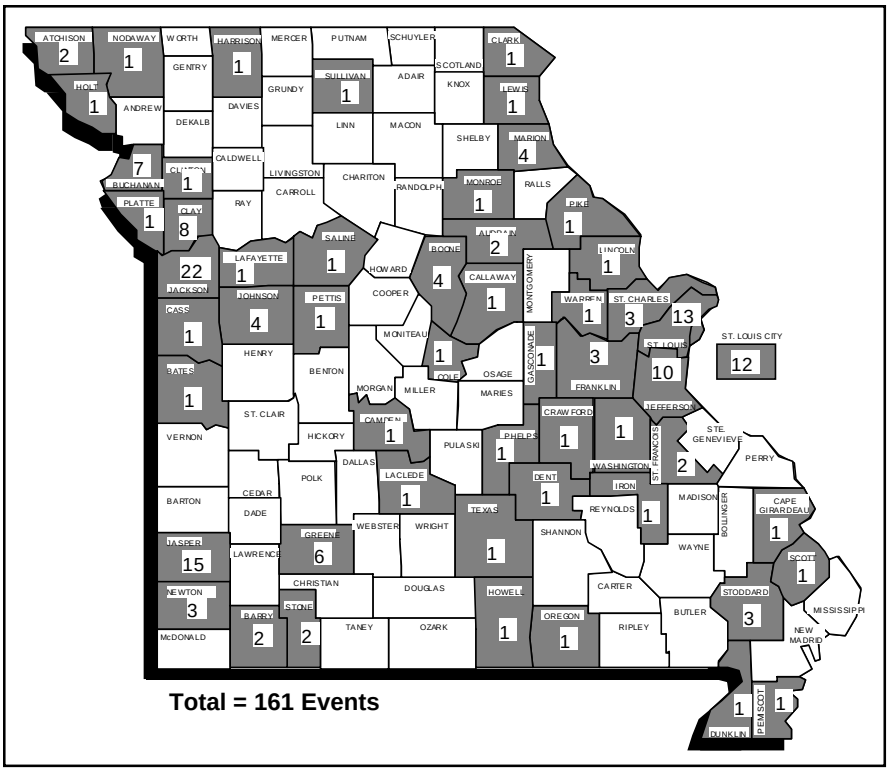

Figure 1. Location of non-petroleum hazardous substances emergency events by county, Missouri, 1996.

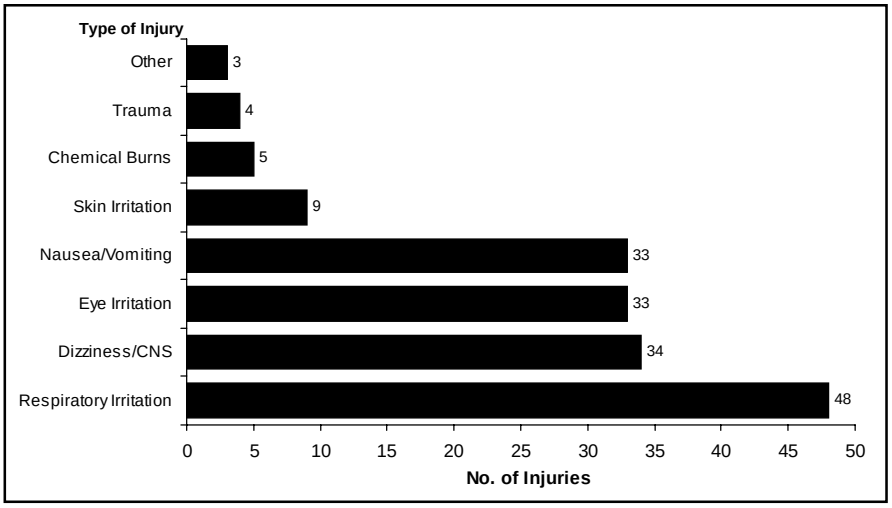

Figure 2. Number of injuries reported by type, Missouri HSEES, 1996.

A total of eight hazardous substances were released in the 12 events involving evacuations. Ammonia was the most commonly released substance, occurring in six events involving a total of 1,275 known evacuees. Chlorine was released in two events involving a total of 340 known evacuees. Nitric acid and potassium hydroxide were released in one event involving 200 evacuees, hydrogen sulfide was released in one event involving ten evacuees and methyl mercaptan was released in one event involving five evacuees. Toluene and dimethyl sulfide were released in one event involving an unknown number of evacuees.

Twelve (7.5%) events resulted in 59 victims, including two deaths. The largest number of victims associated with a release was 29. The most common type of injury reported was respiratory

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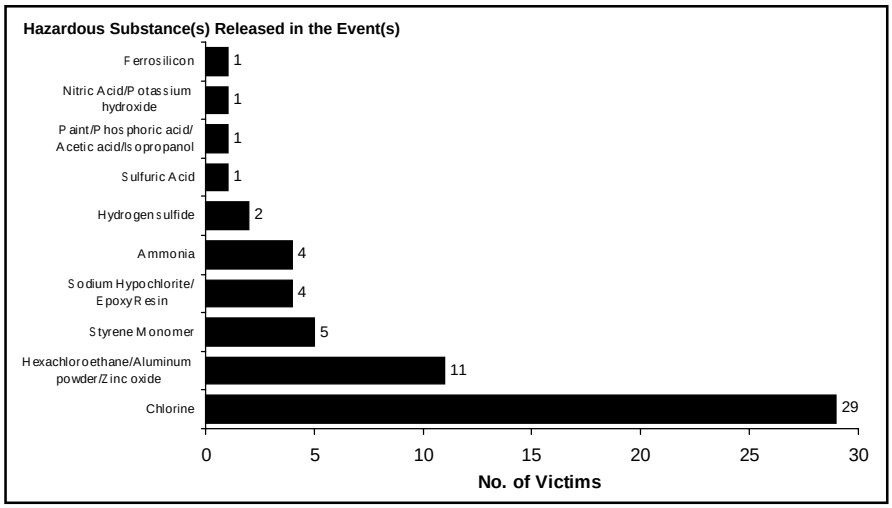

Figure 3. Number of events involving victims by hazardous substance released, Missouri HSEES, 1996.

(continued from page 31)

irritation, which occurred in 48 (81%) of the victims. Other types of injuries/ symptoms included eye irritation, chemical burns, thermal burns, skin irritation, dizziness/CNS, nausea/ vomiting, trauma and other. See Figure 2.

Of the 59 victims, two victims died, 20 were treated at the scene, 13 were transported to a hospital but not admitted, and 24 were admitted to a hospital. The two deaths occurred in two separate transportation-related events, and it could not be determined if the deaths were attributable to the hazardous substances released (styrene monomer and ferrosilicon) or the trauma of the accident.

Employees were the largest group injured by hazardous substances releases again this year. Forty-nine employees, three responders, one police officer and four members of the general public were injured. Two employees died. A chlorine release in a paint booth resulted in 29 (49%) injuries. In one event, a malfunction in the training equipment during a fire drill caused a release of hexachloroethane, aluminum powder and zinc oxide that resulted in 11 (19%) injuries. Styrene monomer was involved with five (8%) injuries in one event. Ammonia was involved with four (7%) injuries in three events. In another event, a release of sodium hypochlorite and epoxy resin resulted in four (7%) injuries. Hydrogen sulfide was involved with two (3%) injuries in one event. The remaining hazardous substances were involved with one injury, each. See Figure 3.

Reporting Events

We are indebted to the Missouri Department of Natural Resources' Environmental Services Program for helping us investigate these hazardous substances emergency events. We rely heavily on this unit for notification of releases and frequently contact them for circumstances surrounding a release.

If you are aware of any emergency events involving the release of non-petroleum, hazardous substances that may not have been reported to the Missouri Department of Natural Resources, please contact:

Lori J. Harris, HSEES Coordinator
Missouri Department of Health
P.O. Box 570
Jefferson City, MO 65102-0570
Ph: (573) 751-6111 or
(800) 392-7245

State Public Health Laboratory Report

Newborn Screening — Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, B.S., M.B.A., Chief, Metabolic Disease Unit

	Mar 97	Apr 97	Total YTD
Specimens Tested	9,422	10,027	37,856
Initial (percent)	63.7%	64.8%	24,327
Repeat (percent)	36.3%	35.2%	13,529
Specimens: Unsatisfactory	224	228	898
HT Borderline	874	830	3,514
HT Presumptive	24	24	85
PKU Borderline	0	2	3
PKU Presumptive Positive	0	2	3
GAL Borderline	38	42	152
GAL Presumptive Positive	3	4	10
FAS (Sickle cell trait)	71	94	311
FAC (Hb C trait)	20	23	90
FAX (Hb variant)	17	18	61
FS (Sickle cell disease)	1	0	3
FSC (Sickle C disease)	2	2	6
FC (Hb C disease)	0	0	1

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin, YTD = Year to Date

Tuberculosis and Ultraviolet Light Therapy: A Bright Idea for Building Partnerships

Vic Tomlinson, M.P.A.
Bureau of Tuberculosis Control

James J. McEnroe, Ph.D.
Electric Power Research Institute
Health Care Initiative

Summary

Since the mid-1980s, the marked increase in the incidence of new cases of *Mycobacterium* tuberculosis in the United States has focused the medical community's attention on low-cost, effective strategies to prevent the transmission of tuberculosis (TB). Although TB rates have declined over the past three years, it continues to be a public health concern. The use of ultraviolet (UV) light has emerged as a relatively inexpensive and effective means of preventing the spread of tuberculosis—and other airborne diseases such as measles—in a variety of high-risk environments.

A unique public-private partnership was formed in Missouri during 1996 to address the need for environmental controls in some high-risk facilities. Union Electric in collaboration with the Electric Power Research Institute Health Care Initiative (EPRI HCI) brought together a task force consisting of the St. Louis City, St. Louis County and Missouri Departments of Health, Union Electric, EPRI HCI and others. The project should shed light on the effectiveness of UV lighting in reducing TB transmission rates. However, just as crucial, the project brought together public and private entities in a creative coalition to address a shared health problem. Together they provide a model for partnership at a time when it is more important than ever to develop cooperative efforts among state, federal, corporate and community organizations.

Introduction

Bolstered by the increase in AIDS and other immunosuppressive diseases, as well as an increase in the number of persons in at-risk populations, TB reemerged in the 1980s as a public health concern for many United States communities. At a time of financial constraints, it is crucial that community health authorities, corporations, researchers and others find cost-effective and clinically effective ways to partner and share resources.

Inspired by a national project developed by EPRI, a coalition of member electric power utilities, a St. Louis-based task force was convened to identify, implement and study one potential low-cost means of preventing the spread of TB: ultraviolet germicidal irradiation (UVGI). The task force brought together a variety of collaborators: the local electric power utility—Union Electric, the Missouri Department of Health, St. Louis City and County health authorities, a community health nurse from the Grace Hill Neighborhood Health Center, clinicians from Washington University School of Medicine, consultants, architects and engineers. Together they identified several high-risk institutions in the state of Missouri, three in the St. Louis area and one in a smaller, mid-state city.

The institutions include two homeless shelters, a large medical center that serves high-risk patients and a state correctional facility. According to 1995 data, the Department of Corrections had a TB positivity rate of 14.3 percent among inmates and employees combine.

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Ultraviolet Research

In the 1930s, Dr. Richard Riley conducted research at Johns Hopkins University that clearly demonstrated ultraviolet light's efficacy for germicidal irradiation in the laboratory. But with the advent of drug therapies, that research lay dormant for 60 years. Today, Riley's work is commanding new attention from such experts as Dr. Edward Nardell of Harvard Medical School, Dr. Jonathan Freeman of the Harvard School of Public Health, and Dr. Melvin Furst, a Harvard-based expert in ventilation. Dr. Phillip Brickner of St. Vincent's Hospital in New York has been conducting similar research in homeless shelters for over a decade and believes the ultraviolet approach shows extraordinary promise.

For more information see:

Centers for Disease Control and Prevention. Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities, 1994. MMWR 1994;43(RR-13).

Nardell Edward A MD. Environmental Control of Tuberculosis. Tuberculosis 1993;77(6).

Riley Richard L MD and Nardell Edward A MD. Controlling Transmission of Tuberculosis in Health Care Facilities: Ventilation, Filtration, and Ultraviolet Air Disinfection. Plant Technology and Safety Management Series 1993.

Weisman Ellen. Engineering Controls and TB: What Works and How Well? Health Facilities Management 1994;7(2).

(continued from page 33)
A study of 30 St. Louis homeless shelters from 1993–95, including the two that are part of the UVGI project, found TB positivity rates as follows: 14.6 percent in 1993, 18.8 percent in 1994 and 15 percent in 1995.

The project's goal is to install UV lights throughout each target organization or at least in key transmission areas. For example, at the urban medical center, UV lights will be installed in the emergency room, dialysis center and public waiting room. UV lighting is being installed in the visiting area at the correctional center, and lights are planned in congregant areas in the homeless shelters. The program's efficacy will be monitored on a month-to-month basis by examining TB conversion rates for inmates, patients, and employees.

Ultraviolet Germicidal Irradiation: Controversial—But Worth a Look

Although UVGI has traditionally been considered somewhat controversial, there are references in the literature indicating that UVGI effectively eradicates TB pathogens. Beginning with early research in the 1930s at the Johns Hopkins University by Dr. Richard Riley, by Harvard's Dr. Edward Nardell in homeless shelters and Dr. Phillip Brickner in the 60s and 70s showing that TB bacilli are killed by UV irradiation, data on the use of UVGI have shown TB transmission rates reduced by as much as 95–99 percent. See sidebar on page 33. The Missouri task force decided to implement the UVGI project as a means of preventing transmission as well as a research project because it is low-cost (as opposed to other methods such as High-Efficiency Particulate Air [HEPA] filtration) and modest in scope. The project will also contribute significantly to national TB research by gathering current and baseline data from the various settings in which the strategy is employed.

Project Methodology

The project was planned in three phases:

Phase 1: Identify and assess facilities that were willing to participate and in which UVGI could be installed. This phase was conducted during 1996 and is now complete.

Phase 2: Track skin test conversion rates and active TB in the clients and residents of the facilities in order to document the effects of UVGI. TB conversion rates will be submitted every month for a year from the Department of Corrections annual employee screening data.

Phase 3: Analyze data, prepare manuscripts and present the data. It is estimated that it will take six months to complete this phase.

Facilities were selected based on their suitability for installation of upper-room UVGI as well as availability of residents/patients and health services. The project utilizes short wave (254 nm) UV bulbs. UV fixtures will primarily be installed in upper room areas, but where upper room UVGI is impractical because of low ceiling heights (eight feet or less), self-contained UV ceiling units with equivalent room air disinfection capabilities will be substituted. UVGI's effectiveness is maximized when used along with HEPA filtration systems. Ventilation and room air mixing, crucial factors in TB transmission by infectious droplet—and also crucial to the germicidal effect of UVGI—will be quantified seasonally in each facility, along with humidity, also assumed to be influential in UVGI's potential germicidal effects. Quantitative data are also being examined on shelter design, volume, alteration, usage and population density. Fans may be installed when appropriate to maximize the germicidal effectiveness of UVGI irradiation.

Dr. Thomas Bailey, Assistant Professor in the Division of Infectious Diseases at the Washington University School of Medicine, will oversee the data collection and observation process. He will use a two-step system to analyze the data—the group of methods generally referred to as statistical process control. He will look at conversion rates at month-to-

Helpful Hints for Workable Partnerships

- Examine the issues or problems that need to be addressed—and the resources available in the community to address them.
- Choose a do-able task. Don't be concerned about whether it's modest or magnificent! Just do it!
- It's not mandatory to have a huge role. Be a facilitator. DO what you can!
- Share power equally with all players. Likewise, share responsibilities with all players.
- View the common health issue or shared concern as "everyone's concern," and take a team approach.
- Use education and awareness for communicating public health concerns (and prevention) to the community.

month intervals from the Department of Corrections and use the historical data as a benchmark. This graphically displays the conversion rate over time among the people who were tested. This technology will not replace traditional means of infection control, but could be a relatively low-cost way of preventing institutional TB transmission.

Anatomy/Evolution of a Partnership

What is perhaps most instructive and useful in the UVGI trial thus far is that the process provides a creative model for a public-private partnership. The task force evolved as a modest idea for a systemic response that deals with a shared, common health problem from the community, technological and clinical perspectives. A committee began to meet in early 1995 to identify an issue, reducing TB transmision, that seemed attainable. As the UVGI/TB idea came to light, appropriate individuals and groups were identified and invited to sit at the table, including the local electric utility, Union Electric. Individuals from the private sector were helpful in examining financial and technical issues. Community health groups brought in clinicians who understood public health problems. The committee found that each group or individual had its own unique perspectives and resources to offer, and tasks were accomplished more efficiently because power was shared equally by all involved. The committee learned a variety of valuable, practical lessons. Helpful hints for a workable partnership are offered in the sidebar on this page 34.

Project Funding

The Missouri UVGI trial is sponsored through collaborative support from the project partners. Additional support including funding will be obtained, if needed, from various sources such as foundations and other philanthropic sources. Due to variations in facility shape and construction, costs vary for installation of state-of-the-art UV lights. However, the cost is considerably less than HEPA filtration systems and far less than treating TB after active infection. For example, treating a TB patient in the United States costs about $2,000 for outpatient treatment, including medication and monitoring for six months or longer. Treating a case of drug-resistant TB can cost $250,000 or more.

Prognosis and Future Applications

TB continues to be a problem both for metropolitan and for rural areas. Until prevention strategies such as UVGI and others effectively reduce the rate of TB transmission, and until solutions are found to combat new drug-resistant TB strains, TB will continue to be at the forefront of public health concerns. Results from initiatives like this will be of interest.

While the Missouri project is taking place, UVGI is being employed in a variety of institutions throughout the United States—in a national trial and in correctional facilities, hospitals and homeless shelters in areas like New York City, Kansas City, Houston and Birmingham, Alabama, where there have been hundreds of active cases of TB over the past two years. If the data show a reduction in the rate of TB transmission, the use of UV lights could prove to be a cost-effective technology that will have possible applications to other sites such as group homes and public housing units.

The Missouri task force believes that the ease with which the project was conceived and implemented will inspire more successful public-private partnerships and coalition-building in other communities. The project brought together an assortment of parties from the public and private sectors who contributed financial support, clinical data, and epidemiological resources. They found that the study is a great way to mobilize and empower the community—to let *them* decide what's best for *them*. As federal, state and local resources continue to tighten, such joint projects will also help to control—and perhaps finally—to eliminate TB and address other public health issues.

For more information, contact the Bureau of Tuberculosis Control at (573) 751-6122.

For information on the EPRI Health Care Initiative or the TB Project, contact the EPRI Regional Office at (314) 863-1011 or the EPRI National Office at (800) 424-EPRI.

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The *Missouri Epidemiologist* is a regularly scheduled bimonthly newsletter published jointly by the Office of Epidemiology, Center for Health Information Management and Epidemiology (CHIME) and the Division of Environmental Health and Communicable Disease Prevention (EHCDP). CHIME's responsibilities include managing health statistical systems, epidemiological functions and information systems of the department. EHCDP's responsibilities include the prevention and control of communicable diseases and environmentally induced illnesses, including the requisite epidemiological investigations.

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Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health, Office of Epidemiology, P.O. Box 570, Jefferson City, MO 65102-0570, Ph: (573) 751-6128. TDD users can access the preceding phone number by calling (800) 735-2966.

LATE BREAKERS

- On June 11, 1997, Governor Mel Carnahan appointed Dr. Maureen Dempsey to the position of Director of the Missouri Department of Health. Dr. Dempsey has been with the department for six and one-half years and most recently served as Chief of the Bureau of Immunization. Ron Cates will resume his duties as Deputy Director. They can be reached at (573) 751-6001, or you can reach Mr. Cates by e-mail at CatesR@mail.health.state.mo.us.

- The Department of Health recently received notification that some shielding products used for radiation protection contain lead contaminated with very small amounts of radioactive materials. The lead came from another country to a company in Missouri which provided it to the manufacturer of the shielding products. The products include medical devices used in leaded aprons, gonad shields and thyroid shields manufactured after October 1, 1996. Consumers acquiring such products, should contact the manufacturer for further information.

- There is currently an advisory for sunfish, carp, redhorse and other suckers found in the Big River in St. Francois and Jefferson counties and the Flat River in St. Francois County. These fish have been found to contain high levels of contaminants such as lead and mercury. Sampling since 1992 indicate that catfish no longer pose a health risk. It has been recommended, however, that people do not eat carp, redhorse or suckers from the Big River downstream from Desloge to the mouth of the river. For further information, contact the Bureau of Environmental Epidemiology at (800) 392.7245.

- In May 1997, the Missouri Legislature called upon the Department of Health to create an organization which would adequately address the needs of Missourians at risk for and living with HIV. In the effort to fully assess the needs of Missourians for comprehensive HIV prevention and care services, the department will engage in a series of planning discussions with key community partners during July and August 1997. For more information, please contact the Bureau of STD/HIV Prevention at (800) 358-6259 or (573) 526-4565.